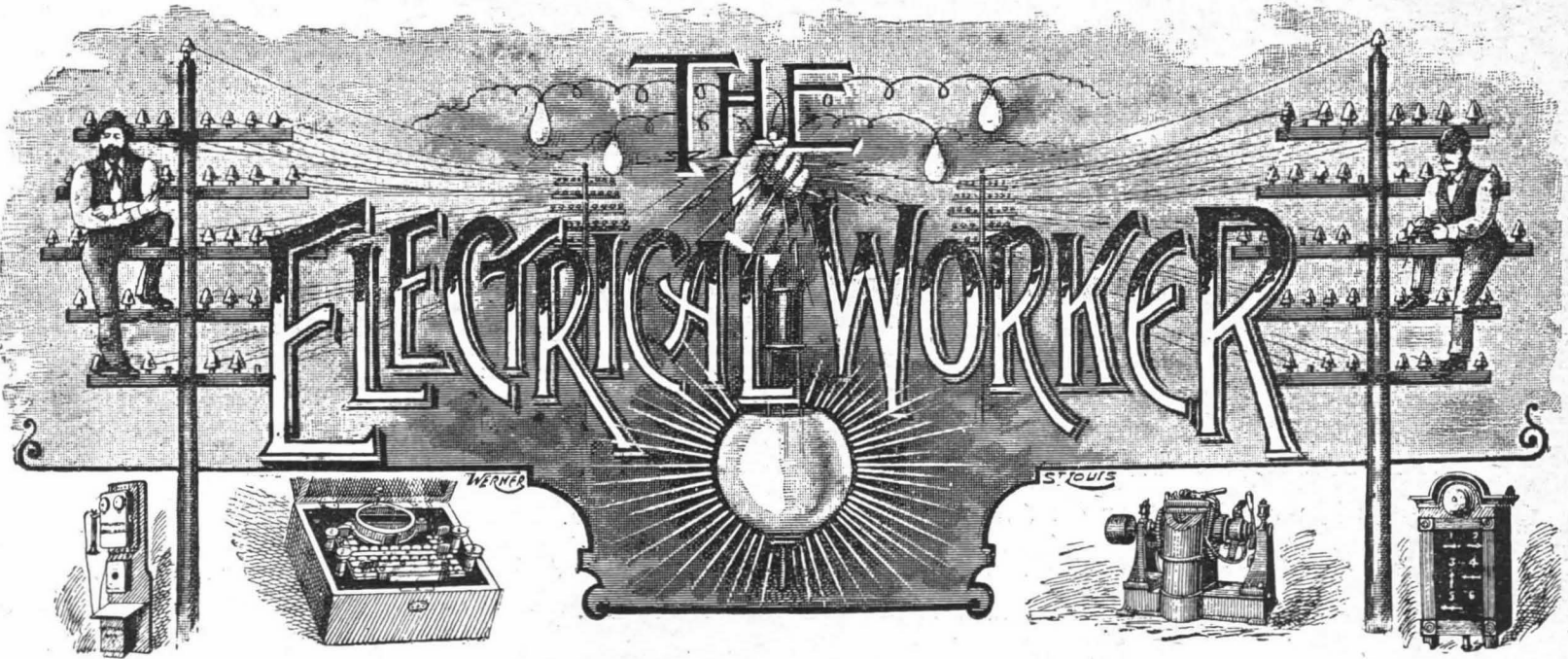


JUN 1893 P.A1



Official Journal of the National Brotherhood Electrical Workers of America.

VOL. 1.—No. 6.

ST. LOUIS, JUNE, 1893.

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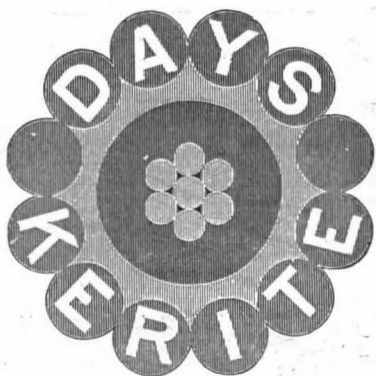
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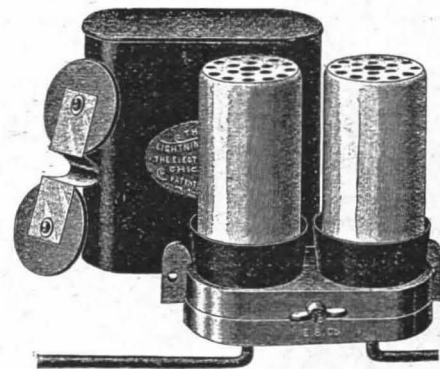


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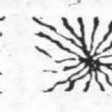





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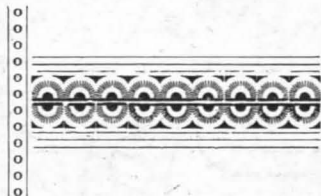


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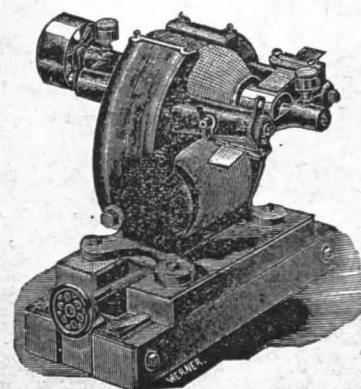
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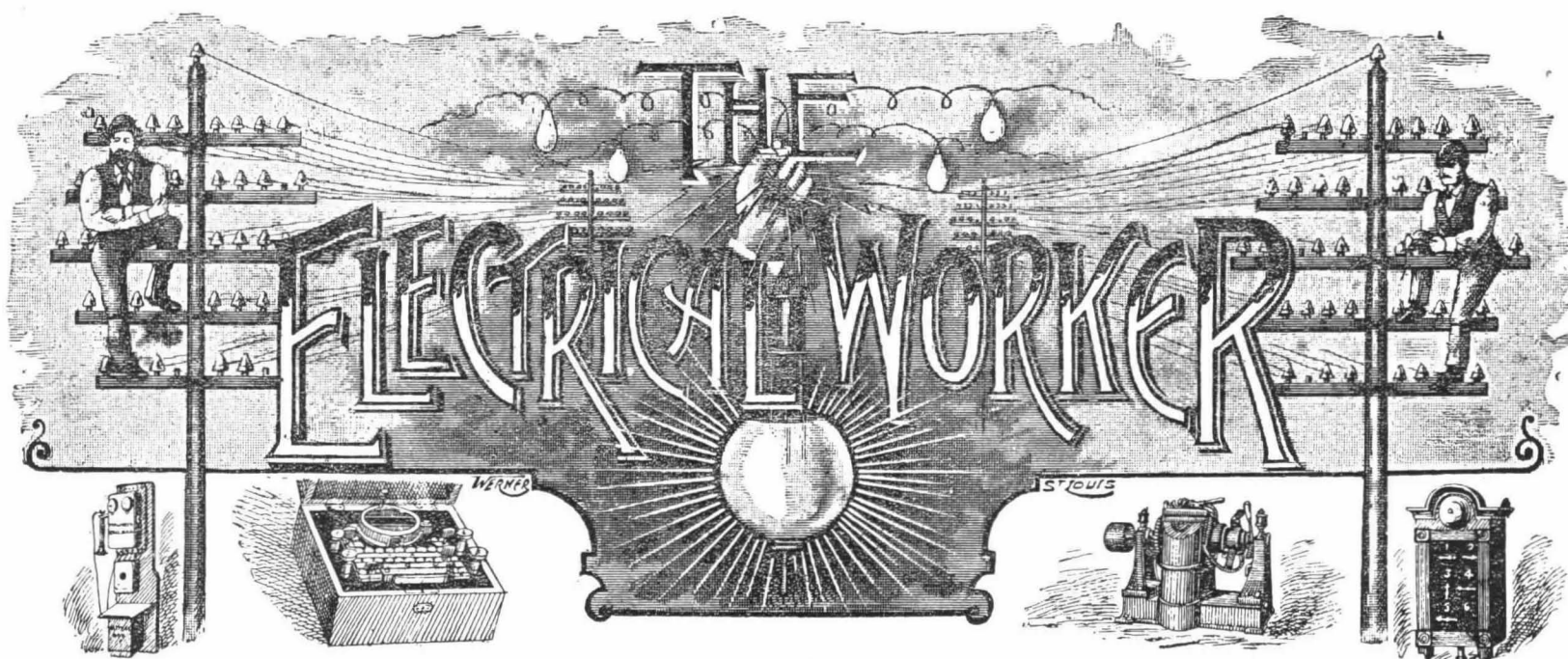
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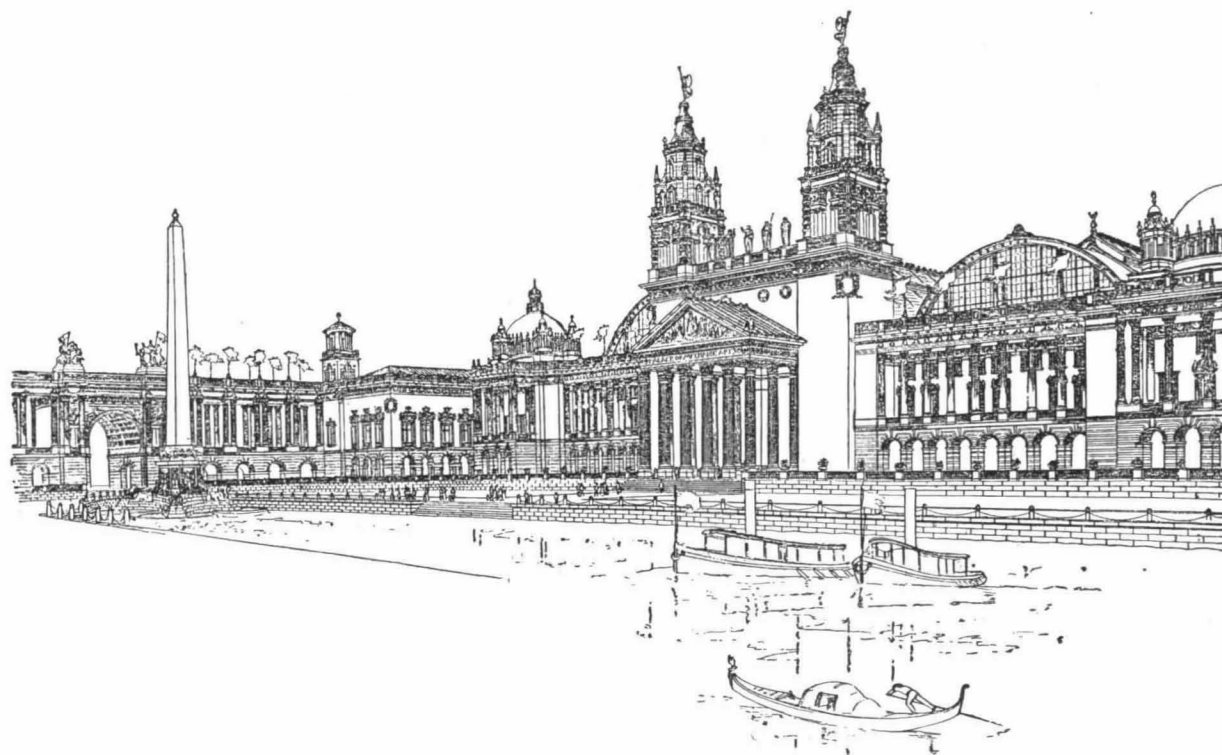


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#### MACHINERY HALL—WORLD'S FAIR.

Machinery Hall, of which Peabody & Stearns of Boston, are the architects, has been pronounced by many architects second only to the Administration Building in the magnificence of its appearance. This building measures 850x500 feet, and with the machinery annex and power house, cost about \$1,200,000. It is located at the extreme south end of the park, midway between the shore of Lake Michigan and the west line of the park. It is just south of the Administration Building, and west and across a lagoon from the Agricultural Building. The building is spanned by three arched trusses, and the interior presents the appearance of three railroad train-houses side by side, surrounded on all the four sides by a gallery 50 feet wide. The trusses are built separately, so that they can be taken down and sold for use as railroad train-

houses. In each of the long naves there is an elevated traveling crane running from end to end of the building for the purpose of moving machinery. These platforms are built so that visitors may view from them the exhibits beneath. The power from this building is supplied from a power-house adjoining the south side of the building.

#### The Greatest Tribute to Civilization.

Discounted by its many visible imperfections, the Chicago Fair is to-day vastly the grandest tribute to civilization ever presented in the world's history. Its incompleteness is painfully impressed upon the visitor in every department, but these blemishes will gradually lessen with each day, and

a month hence there will be little to mar the most imposing spectacle ever witnessed by any people, ancient or modern. It would well repay the student of progress to come from any land, however distant, simply to see the great composite city of the world's grandeur presented on the Exposition grounds, without entering any of the gigantic temples crowded with the handiwork of every clime, and the achievements of science. No such realistic panorama of the world's architectural magnificence has ever been given, or even approached, in all the varied records of the past ages. It has revived all the splendor of the ancients and all the advancement of the present, in one group that blends in sublimest luster the most exquisite attainments of mankind.—[A. K. McClure, in the Philadelphia Times.



### Electric Heating.\*

BY S. B. JENKINS.

The extensive use of heat, in the economy and comfort of daily life, is seldom observed; and the expense of, and labor incidental to the varied applications, still less frequently estimated.

The importance of heat is readily perceived upon reflection, but the exact estimation of its cost is a matter of considerable difficulty in common practice.

There are three distinct and available agents for the generation of heat for domestic and industrial purposes, viz.: Coal, Gas and Electricity.

It has been stated by Tyndall that he was able to obtain from the combustion of coal in the best range, a useful effect of 6 per cent and that the average of domestic practice was 3 per cent.

The combustion of gas gives a considerable higher efficiency, but its use is not at all commensurate with coal.

In the generation of heat from electricity, an efficiency in the production of useful effect is realized vastly greater than either and with which they can never possibly compete.

The perfection of conversion, the unvarying quality, the ease of precise estimation, and the ability to absolutely localize and control the exhibition of the heat of electricity, are unique and decisive points of superiority.

Ethically the rheostat is an electric heater, and has been the inspiration of many inventions in electric heating, but the invention of numerous electric heaters, as such, has resulted in their being set apart as a distinct type of electrical apparatus. While the fundamental principle of this conversion was understood, the early apparatus for the conversion, exhibition, and utilization of the heat, in the production of useful effect, was crude and inefficient; the idea seeming to prevail that it was only necessary to pass the current through a resistance, and the full effect must be realized, the intimately involved principles of radiation, conduction, and convection having apparently been omitted from consideration.

However, like this noble city of which it has been said, "A man who has never seen it may hear the Chicago man's description of it, and by the time he can get to see it, it is all true"; so the electric heater has advanced, through the labor of intelligent inventors, until it to-day meets fully all reasonable demands, and is a commercially entity.

The first United States invention of record in this field was made by G. B. Simpson in 1859. The earliest authentic electric heating in this country, so far as can be ascertained, was that done by Prof. Moses G. Farmer, who states that he heated his house, in the year 1867, with an electric heater on the lines of a rheostat.

Some less noteworthy and abortive attempts were made later by others, but it is only within five years that systematic attempts have been made to put electric heating on a commercial basis with any degree of success. This delay is the fault of neither the inventor, the capitalist, nor the electric heater, but is the result of conditions; for obviously, when produced from batteries, electrical energy was too expensive to be used in the very limited quantities called for by electric lighting, and entirely prohibitive as regards its use for heating; not, however, on account of any inefficiency in the conversion into heat, for the incandescent lamp of to-day has an efficiency of 5 per cent, with a loss of 95 per cent, and in the electric heater these figures are practically reversed.

The introduction of the dynamo, with the consequent increase of the volume of current and decrease of cost, gave a powerful impetus; first to lighting, then, as station capacities increased, to the distribution of energy to motors, and finally, heating.

Owners and managers of generating plants perceive that, if electric lighting and heating are on a similar basis, the output is from forty to sixty times as much for heating as for lighting; and that the load line, when the energy is furnished to lights, motors and heaters, will be much more uniform.

The heating of churches on Sunday would come when the lighting and motor load was very small.

It remains to determine the commercial status of electric heating, which includes its operative advantage and cost.

The production of large volumes of electrical energy from water power has resulted in a demand for the electric heater in utilization thereof. A number of proposals have been received, from established power plants, to furnish energy at a definite price under definite conditions; such were the price and conditions, that electric heating was much cheaper than any other method, and in every way beyond competition.

It requires some time to assimilate the idea of running two large generators for sixteen consecutive hours to heat one building simply, for the turning

on of electric lights in that building would be merely an incident and would not appreciably increase the load; this, however, is precisely where we are to-day when water power in abundance is within ten or more miles.

It is sought to produce heat only when needed, and to apply it only and exactly where its useful effect would be greatest. This is the secret of the present success of electric heating.

Ovens, the service hot water boiler, and some other continuously operated apparatus are constructed so that the temperature can be varied within wide limits, without the use of an exterior resistance.

In heating houses, offices and buildings generally, the heat may be proportional to the necessities, and admit of wide variation at pleasure.

One large city house, that has been heated since the fall of last year, has a large primary heater in the cold air duct where the displaced hot air furnace stood, and just below where the feeder pipes branch off to the risers; this heater is controlled by a switch close by.

Just within the register openings to the rooms above are located smaller "reheaters," each controlled by a switch in the apartment. In the early fall or late spring, when a gentle heat only is desired, the large primary heater is run; when more heat is necessary, the "reheaters" are turned on. Should heat be required in moderate whether, in only one apartment, it is instantly at hand without affecting other rooms.

Sectional radiators are constructed of the same general design as steam apparatus, together with stoves and portable heaters of every desirable size and style; and the first cost of this heating apparatus is in general terms not more, and often less, than ordinary apparatus doing similar work in a much inferior manner; for there is no odor, dust or gas, no coal pile, no ash-sifting, no attendance of account, but there is absolute control and knowledge of exact cost.

A complete equipment for the kitchen, laundry and butler's pantry is provided, with which all the domestic operations may be conducted with perfect certainty and cleanliness, in less time and with half the labor incidental to old methods.

Beef is roasted at the rate of seven to seven and one-half minutes to the pound, and the quality of the work is only excelled by the ease of its performance. The heat, which is largely radiant, and of great intensity, is produced evenly all around the oven, the effect being so perfectly uniform that it is not necessary to baste the meat, or to turn the bread or cake while cooking.

Broiling is difficult under ordinary circumstances, as an intense, clear fire is required, and care must be used to avoid smoking the meat, as that gives it a bitter flavor; the electric broiler meets all requisitions perfectly and easily, and steaks and chops are cooked in the usual time to the delight of connoisseurs.

Tea and coffee pots, of all styles, making the decoction from "the cold" in from six to ten minutes, of perfect quality, steam cookers, stew pans, spiders, etc., are provided to meet all demands.

The domestic supply of hot water is furnished from the electrically heated copper service tank, or a heater attached thereto.

The first cost of this equipment is about the same as that of the ordinary outfit.

As the laundry irons are not set on a stove, they may be kept perfectly clean. The heat is an effective so-called "live heat," without the attendant discomfort in a hot day of a highly heated stove.

A variety of apparatus for industrial use is shown, such as soldering irons, devices for braising and soldering, electrically-heated mufflers, and smothering irons for tailors', dressmakers' and hat-makers' use. These are all simple, easily operated, and partake of the general advantages, and have individual features of excellence. Electric tramcars are heated equably and comfortably without difficulty.

The ultimate large development of electric heating necessitates the production of vastly greater amounts of electrical energy than have heretofore been considered necessary; and it will be a growth, steady and sure, culminating, in less time than electric lighting has been before the public as a commercial entity, in a great industry, second only to the supplying of food.

It is now being adopted by many who are conversant with its advantages, who can at once replace the old contrivances with the new, and must very shortly be adopted by the many who, doing a part of the labor incidental to the household, seek to do it as easily, cleanly and economically as possible, and by those who consider the welfare of dependents and that observance of economy, which is both wise and honorable.

It was, in times past, faucet versus pump; it is now switch versus coal-hod, and the triumph of the switch is unquestionably at hand, for the introduction of electric heating into houses, offices, hotels, hospitals and theaters is being accomplished on a purely commercial basis.

### Fire Risks in Electric Insulation.

BY FREDERICK A. C. PERRINE, D. SC.

In spite of the best designed and best constructed system of wiring, accidental crosses may be occasioned by decay in the insulation or by mechanical occurrences which bring the two wires of the circuit into contact, cutting out the lamps or motors beyond the point in question and throwing the whole power of the machine into a much diminished resistance; a great rush of current follows, and high heating is produced. Similar effects may be produced by crosses with the wires from another system in which the pressure is greater than that for which the wiring has been calculated.

Now, to guard against the evil effect of any such great accidental increase of current it is found advisable to sacrifice some one portion of the circuit in question and avoid the overheating of wires in the neighborhood of inflammable materials. For this purpose, at all the branches in any circuit, as well as at the point where the main wires enter the building or leave the dynamo, small porcelain boxes are placed containing terminal contacts for the wires and making a break in the circuits which enter and leave them; in this gap between the contacts safety-fuses are introduced into the circuit. These safety-fuses are short pieces of wire made from some fusible alloy capable of melting at a temperature too low to set fire to any inflammable material on which it may fall while melted. Each fuse for any circuit is so proportioned that a definite amount of current will melt it, and in this manner a dangerous increase of current will automatically break the circuit and stop its flow.

Indeed, these little safety-fuses are the most important element for protection against fire in any electric installation, and the greatest care must be used in their location and proper maintenance. Provided the wireman in his haste has not substituted for them bits of copper or handy nails, the installation which is properly "fused" may be considered safe.

Any cause whatever of an increase of current above the normal will make these ever watchful little safeguards surrender their lives to the good of the remainder of the circuit. To be sure they are but mortal and have their almost human failings, and they may persistently burn out if placed in an overheated room; they may not be quick enough to prevent some "sneak" current which follows a minute break in the insulation from setting fire to a board along which it finds its way to a neighboring gas pipe, but in the main they are true monitors and their warning should be heeded.

The "leaks," "crosses" and "sneak currents" spoken of above are all fertile causes of electrical fires, and are occasioned by defects in the insulation of the wires, which result in currents passing over resistances so great as to cause undue heating. Either by the "crosses" sending too great currents over the wires properly proportioned for their normal work or by the "leaks" sending currents of electricity over semi-conductives, such as damp woodwork, while the "sneak currents" are minute leaks which do not send a sufficiently great amount of current astray to increase the amount in the circuit sufficiently for blowing out safety-fuses.

While the safety-fuses are the reliance when these accidents occur, yet in the normal and possible circuit the fuses are never called upon to perform their office. Insulation is the means of prevention of all these dangers; insulation is the great need in a safe installation; to the insulation we must look to installing our plant, and to the maintenance of the insulation we should devote our energies after the circuit is in operation.

As modern plumbing, gas fitting, and steam piping have revolted against concealed work, so the first method which has been successfully adopted for safety running wires in buildings and the method which is always used in factories is to run the wires in plain sight, and when porcelain or other non-absorbent insulators are used in supporting the wires to keep them away from contact with the surrounding woodwork or walls a very high degree of safety is obtained. There is the single objection to this method of construction in the power the electrified wires have of attracting and retaining floating particles of dust or lint, such as are often continually flying in the air of a manufacturing establishment. I have seen wires in such a place, which originally were hardly more than a quarter of an inch in diameter, attract cotton lint till they were more than an inch across, having the appearance of some hairy caterpillar creeping along the beams of the floor above, and I have known such dust-laden wires to carry a small fire in all directions till, before the original size could be extinguished, a half dozen other fires had been kindled and the building was doomed to destruction. Of course such an effect

\* Abstract of paper read before the Chicago Electric Club May 22d, 1893

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is only indirectly due to the electric installation, but, had the danger been appreciated and the wires kept free from such attracted particles, the small amount of labor necessary for the task would have saved thousands of dollars.

In an office building or a house, however, these unmasked wires interfere too much with the surrounding decorations or wall finishings, for, whenever the circuit is run, lights are needed in many places in the room, and the network necessary on the ceiling is apt to be very unsightly, especially as it seems impossible to run and keep the wires straight in all changes of temperature unless they are supported through their entire length, so that the expense of endeavoring to produce a decorative piece of work in such a manner amounts to as much as that necessary to do concealed work safely.

At the present time the likelihood of defective workmanship and mistakes is recognized much more fully, and it is not attempted to build an inflexible system into the walls of any building, but methods have been devised by which it is possible to withdraw defective wires and replace them without injury to the walls or woodwork of the building. Of course something must be fixed in the installation, but it is preferred at the present time to fix the conduit conveying the wires rather than the wires themselves or their insulation.

In old buildings where gas has already been installed and it is not deemed advisable to tear out the walls for a system of conduits there has been devised a neat molding having two grooves into which the wires may be laid, where they are then covered by a cap running lengthwise of the molding, and which, when completed, may be painted or made to harmonize in any other manner with the neighboring decorations.

While this molding system of conduits is extensively employed in old buildings and along wooden walls such as are found in our magnificent river and sound steamers, it is generally regarded with less favor than a system of round tubes made of some insulating material which are run under the plaster and terminate in junction boxes from which the wires may be pulled through the tubes. This is perhaps the safest and most satisfactory system for wiring any building, and this method combines the least possible interference with the decorations together with the greatest immunity from fear of fire. The tubes here spoken of are made in some cases of paper strips wrapped spirally around a mandrel, the tube so constructed being plunged into melted asphalt which is maintained at a high temperature; some are made of a lower grade rubber, and others of a combination of a paper tube, with a rubber sheath, and the whole finally finished by a braided covering. The two latter tubes, being flexible, do not require any elbow pieces at the bends and present a smoother internal surface for drawing in the wires, but they possess the disadvantage that, on account of their flexibility, they are not so capable of resisting accidental blows or misdirected nails while the plant is being installed.

When such a complete system of tubing has been installed in a house and connected to the junction boxes, there is provided a continuous insulating and waterproof conduit passage for the wires from their original entrance into the house to the last light. The fuses which must be as carefully attended to on this system as on any other, prevent any great rise in the temperature of the wires due to any external causes; while the tubes themselves offer no path for the leak through a defective insulation, and, in consequence, any system so installed may be considered to be perfectly safe against danger from a fire caused by the electric installation.

#### Welding Electricity.

Two Belgians have discovered a method of welding by electricity which will be of immense use in the arts. Electricity forced into water separates it into component parts, hydrogen and oxygen. A glass jar with a leaden lining is connected with a conductor of positive electricity. A pair of tongs connected with a negative pole and having insulated handles is used to take up a bar of iron, for instance, and put the end in the water. The oxygen is forced to the leaden lining while the hydrogen collects about the submerged metal, which quickly produces an intense heat. The hydrogen, being a poor conductor, offers intense resistance to the current, and this generates the heat. It is shown the most refractory ores can be fused by this process, and as it is possible to produce in this way large crystals of carbon, diamonds, rubies and sapphires may be made by the process in any quantity desired.

Thy friend has a friend and thy friend's friend a friend. Let thy words be few.—[Talmud.

#### Some Thoughts About Storage Batteries.

My kind readers who may have read some of the writer's notes on storage batteries before in this popular little paper, will be very much inclined to say, I fear, "this man must have storage batteries on the brain;" and, to a certain extent, such an opinion would be true enough. No one can work over and study the mysteries of the storage battery without exercising thought and brain until it becomes a part of himself, and possibly a new phrenological bump may be developed.

We know by chemical tests and all that sort of thing, what the changes are, to a certain extent, when a current of electricity is forced through a storage battery, but why such peculiar results should be accomplished is beyond explanation. Electrical energy produces chemical energy, and this same chemical energy produces electrical energy again, and this produces kinetic energy or working force, a force that can be made useful mechanically.

Nature put together certain atoms in metals. They cling together quietly and tenaciously. They live together, as it were, like happy man and wife, in perfect unison. The surrounding of these atoms may be salt water or acids and water, still they are not much affected or disturbed, for a long time at any rate; but let an active, meddlesome current of electricity creep into their surroundings, then, like a mischievous lawyer looking for a fuss, it brakes up the union and man and wife seek for a divorce, a separation. So the atoms of metals become disturbed by the electric current and are forced apart; and as, by the laws of nature, every atom has motion and evidently desires and impulses for the selection of mates, commotion takes place, the equilibrium is broken. This results in energy being given out in some form, a difference of potential established, until the former equilibrium is found, then all is quiet as before.

The writer has often been led to think that the earth is a great storage battery and the sun an ever powerful generator of electric currents which are constantly producing chemical changes, constantly making new forms out of old forms, forming positive and negative electrodes and evolving gases in the changes.

Should we keep our batteries hermetically sealed while charging them with a current from a dynamo so that nothing could escape, we would not have to wait long until a grand explosion would take place. The hydrogen gas evolved by the chemical action produced, not being able to dissipate itself in the air and becoming condensed, even in a little battery exerts tremendous power, and an explosion is the consequence. The box is rent in pieces, parts of it driven a long distance, and the result is wild havoc and perhaps serious injury to the operator.

So in the earth. The rock, the various strata forming the crust of the earth far below the surface, may be charged with electricity from the sun's rays. The nature of rocky formations may be such that one stratum becomes positive and the other negative. As in the closed storage battery, the gas which is evolved during the process of chemical changes is locked in and can not escape. The consequence is an explosion, the earth rocks and quakes, immense masses are thrown in the air, vast mountains sink and others are formed until contending potentials settle their differences, equilibrium is found and the earth is quiet again. But new formations have taken the place of the previous ones, the sun changes the new elements of his storage battery, a difference of potential is again set up, the equilibrium is again disturbed and another explosion, another earthquake is the result. Thus the sun is constantly producing chemical changes and developing energy of some kind, while motion and its sequence, light, electricity and heat are doing nature's bidding.

Nor need we go into the bowels of the earth to find an example of our great storage battery. Let us examine one which, though not so large, is fully as active—our own brain. How completely is the similitude to the storage battery carried out here. The stomach and the lungs receive the fuel for the human engine while the heart may be considered a powerful little dynamo pulsing and throbbing without an instant's pause, ever charging the thousands of cells of the brain, which, through its network of conductors, carries thought and volition with electric rapidity throughout the system, developing energy in words, in acts, in thought and invention, the influence of which is felt to the uttermost parts of the earth and the effects of which will live forever.

Energy is never lost; motion changes, never ceases.—J. K. Pumpelly in *Popular Elec. Monthly*.

Let him who neglects to raise the fallen fear, lest when he falls, no one will stretch out his hands to lift him up.—[Saadi.

#### Telegraphing to Trains.

Telegraphing from a train in motion has for some years been practiced in this country; but in this, as in many other electrical applications, America is ahead of European practice. All Europe stood horror-stricken not long ago at the awfulness of a railway accident on the Riviera. The station master dispatched a train on the wrong line to its doom of rushing into another train and crashing over the precipice. Bells were rung and people shouted, but there was no means of stopping the train wrongly started, and the station master shot himself as soon as he heard the crash. This and other accidents more or less similar have appealed so strongly to railway directors for the necessity of establishing a means of communication from trains in motion that European engineers are now engaged in testing various systems whereby this can be effected. Some recent trials at Algeria are said to have been most successful. The tests included (1) the exchange between a train in motion and the station; (2) between two trains in motion; (3) the telegraphic stoppage of a train—started and out of sight, it was ordered to stop, start again and return to the station; (4) two trains started on the same track and approaching each other at an express speed of nearly one and one-quarter miles a minute, avoided collision by mutually and automatically warning each other by an indicating of their direction, and the position according to kilometer posts which they had attained. The signaling arrangements are carried out by M. Etienne, the well-known inventor. The fact was established that every train can be kept within actual call of the station at any point in its route, and thus one of the most fertile causes of frightful accidents on railroads may now be removed.

#### The Telephonemeter.

A new and ingenious contrivance has been put on the market in Berlin and London. For some time Dr. Strecker, chief inspector of the German Government telephone department, has advocated the measuring of the telephonic conversation carried on by each individual subscriber, thus enabling the telephone companies to check the misuse by non-subscribers on the one hand, and to divide the burden of payment on the part of the subscriber commensurately to the number and length of conversations indulged in. It is obvious that such a system, which asks a subscriber to pay only for services actually rendered by the telephone company, is far more reasonable than that which charges indiscriminately a yearly rental, no matter whether the subscriber be a busy stockholder, merchant or fashionable tradesman, who is constantly ringing up the exchange, or a retired farmer, who only occasionally unbooks his receiver. Dr. Strecker suggested the construction of the instrument which would register the time of each conversation from the time of ringing up the exchange to the ringing off signal. He showed that the principle of charging for telephonic conversation according to the time, which has been successfully introduced and practiced on long-distance lines, could and would be made universal if a simple, reliable and accurate meter could be devised. The German Government Telephone Department thereupon issued a programme inviting the construction of a telephonemeter that would enable the yearly rental to be abolished and the substitution of a fixed rate according to the duration of the conversation. This invitation has been taken up by a leading firm of telephone engineers, who have patented an approved form of telephonemeter. The object of the instrument is announced as being to control the duration of telephonic conversations and to total up the same. It is intended to connect it to the telephone station, and it consists mainly of a watch or clock movement having a starting and stopping arrangement, which is operated by unhooking the receiver from and replacing the same to the automatic switch. It is intended to increase the efficiency of the meter by an arrangement which will permit the telephone to be used only when the clock is wound up, and will show when the clock is running down.

#### Telephone Apparatus for Divers.

Many of the apparatuses used for maintaining telephonic communication between divers at the bottom of the sea or river and the boat overhead have been found unreliable and unsatisfactory. An improved system comprises a Hunnings transmitter, combined with a receiver wound with a low resistance coil and suitable for a battery current. The circuit leads to a receiver and transmitter contained within the hood worn by the diver. The operator above the water can control the conversation by means of the break key. When the diver wishes to speak he pulls on the life line and notifies the operator overhead, who then presses the key and puts the circuit in condition for communication. The whole outfit is compact and handy.

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### The World's Fair.

Since the days of the building of the Tower of Babel we doubt if ever there were so many nations gathered together as can be found daily at the World's Fair Columbian Exposition, all in pursuit of that happiness which the U. S. Constitution says we are entitled to.

Nearly all nations, all creeds, and all colors are represented in this daily kaleidoscopic view of humanity. From the frozen regions of the frigid zones to the warmth of the tropics, from the far East to the far West, from "Dan to Beersheba," have exhibitors and visitors come to pay respects to Uncle Sam to see the wonders of the universe gathered within the walls of the White City. The descendants of the oldest nations on earth, from nations that were partly civilized at the time of the flood, nations that represent thousands of years of history, are gazing in awe and wonderment on the youngest and most advanced nation on earth. Pages and volumes can and will be written of this wonderful exposition and as one paper can only give a small portion of its columns at a time to its description we will borrow from the eloquent pen of a writer in the *Inter Ocean* and give his description of the

#### ELECTRIC FOUNTAINS.

Of recent invention and construction the electric fountain has been so perfected within a year or two, that it is one of the marvels of electrical phenomena, besides being the most brilliant and attractive display that electric lights can or have been made to produce.

Two electric fountains add to the grand and beautiful illuminating effects that continue the day after sunset at the Fair grounds. They are in all their arrangements and mechanism the most perfect which have as yet shot up their kaleidoscopic colorings for the delight and to the amazement of multitudes. The General Electric company is to be credited with the displays the fountains afford on each night of illuminations, and Luther Stieringer is the inventor whose mechanical genius was invoked to produce the beautiful effects caused by the burning incandescence of globules, jets, sheets and columns of water in the glare of powerful electric lights.

Advantageously situated at the head of the great basin in front of administration building and flanking the MacMonnies fountain, the electric fountains have been the features of the illuminations, and while marveled at and provocative of a claim, these electrical wonders, like all other phenomena of the new and universal element in part subservient to man's use, are little understood, or how the varying and gyrating colors of the fountains are made is not known at all outside of the initiated.

Intricate as the machinery may be that produces the transcendentally beautiful light effects, the fact is the light with all its varying colors, prismatic in change and instantaneous, is simply produced. The mystery of the ignited waters, apparently ablaze, and changing colors with the facility of a chameleon, is intensified by the fact that this light is made subterraneously, out of sight, down in the depths, though it appears above ground in heavenly colors and with vivid auroral effects.

#### WHERE THE LIGHT IS MADE.

The light is made down in a hole, in a circular submerged chamber, where nineteen marine search lights in each fountain are reached by currents of electricity and carbon cases are set aglow. These lamps are identical with the search lights aboard modern men-of-war, save a twenty-two inch parabolic copper reflector, silver lined, is substituted for the lens used at sea, and these reflectors shoot up beams out of the ground chamber to a distance of 150 feet—straight rays like the lines so often seen when Northern lights are at their brightest. How then is this white or colorless light made to assume all the hues of the rainbow, faintly tinted at times,

to be instantaneously changed into the pronounced spectrum of the arch of the covenant? It is simple enough. Over each light above the bowl-shaped reflector is a fan-shaped screen glazed with different colored glass, green, white, dark green, ruby, blue and yellow, and the electric beams passing through these panes of glass and up through an iron pot-shaped orifice capped with ordinary roofing, or skylight glass, strike the eyes of the beholders as if every globule of water had become a prism and were reflecting and shedding colors and light like the facets of a Kimberly diamond.

The light power of the lamps are regulated by clock work, and can be intensified to a brilliancy of 360,000 candle power. The water effects are as simply produced as the light and its colors, and like the lights are regulated from the subterranean chamber. Above the surface and over each pot-shaped orifice there is a nozzle, and through this the water is projected in a column, sheet or innumerable sprays, and the line from below, white or colored, is shot up through the water, producing the vapory, startling and beautiful light effects which make the fountain at times rose-hued, then rudy, or ablaze with intermingled colors.

Each fountain has water piping making an outer circle of twelve wheat-sheaf rings, each containing 116 holes one-eighth of an inch in diameter; an inner circle of six geyser rings containing seven holes, and in the center is a geyser ring with a single nozzle capable of projecting a two-inch column of water to the height of 150 feet. All these rings have water orifices to produce sprays, intersecting jets and thin sheets upon which the colored electric light may play with varying effect.

#### THE COLOR SCREENS.

The color screens, underground in the mystic chamber where the surface display is fabricated, play no small part in the vividness and beauty of the fountain's display. The screens are fan-shaped, horizontal blades which are joined in a disc on a vertical shaft which is geared to line shafts leading to the signal stations, one at which the water pressure and perfection is regulated for each geyser or ring, and the other where the color screens of each lamp are managed. Both stations are electrically connected with the operator at the lamp, and he signifies the amount of water to be volcanically shot up and the special color or colors to illumine the volume as it comes surging out of the ground like some great natural geyser. The glass in each screen is cut in strips to avoid trouble from expansion, and the light of the lamps is shot up through the colored glass at a slight angle so as to pass through the water jets.

The source of the water lies beyond the peristyle—Lake Michigan. The source of the light, in its pure white lucidity is in Machinery Hall. There the electricity is generated by a triple marine engine, Corliss valve gear, of 1500 horse power. Four dynamos of 150 kilowatts are used, and this whole display is painted white, and fronted by an immense switch board, which is an art construction, being built of white marble and set off with bright copper and brass facings and apparatus that set the current of 240 volts to flowing through cables to the fountains, where another suitable switch board supplies each lamp-carbon with incandescent power.

Lieutenant E. J. Spencer, late of the engineer corps, United States army, is the manager of the General Electric Company, and it has been under his supervision that the two electric fountains at the Columbian World's Fair have been brought to a degree of perfection far excelling any predecessors. And they, too, have been few. The first fountain of the kind was erected in 1884 at the Healthieries exposition, London, and was designed by Sir Francis Bolton. The same type was used at other London expositions and at Glasgow, and a similar fountain was used at the Paris exposition in 1889. This fountain was subsequently brought to Staten Island, N. Y., and is the same one now in successful use in Lincoln park.

### EXPOSITION NOTES.

Over 70,000 paid admissions to the World's Fair on the first Sunday of its opening and poor weather at that. Of these the great majority were those who could not spare time for a week-day visit.

Germany's exhibitors number over 6000 and their exhibits in the different departments are valued at \$15,000,000, and the expenses for transportation and installation will foot up to nearly \$5,000,000 more. Of this sum the German Government gave \$1,000,000; Prussian Government \$120,000; Herr Krupp \$500,000 and Baron Stumm \$1,000,000.

The Ferris wheel is rapidly nearing completion and will be ready to revolve about June 15, so the managers say. This wonderful piece of engineering is already one of the great attractions on the Plaisance and is always surrounded by admiring crowds that seem never tired of gazing upon its huge proportions.

The Missouri exhibit in the Agricultural Building is a very pretty and original display. At the entrance you walk under a neatly constructed model of the big bridge, while inside the pavilion is a well-arranged display of all the products of the State.

Colorado, in addition to her vast mineral resources, is rapidly coming to the front as one of the great wheat States of the Union. Her display in the Agricultural Building of this important cereal, embraces nearly 100 different varieties and all of very superior quality.

New Jersey has a very creditable and interesting exhibit in the Agricultural Building. Besides showing specimens of native grains, grasses, vegetables, etc., she has on exhibition quite a little collection of old time and primitive farm implements. Among these are an old time plow, with a wooden mould board, which is considerably over 100 years old, an assortment of reaping hooks and an old-fashioned grain cradle. Around the walls of the pavilion are some very well executed oil paintings of an historic nature among which a picture of Washington crossing the Delaware attracts considerable attention.

Uncle Sam deserves much credit for the National exhibit at the big fair. The different departments are well filled and perhaps it is safe to say that no more interesting and instructive exhibit can be found on the grounds than that made under the roof of the big Government Building. The display in the War Department is especially interesting and is always thronged with visitors. Whether this would indicate that we are not so much of a peace-loving people as we profess to be, may perhaps be doubted, but at any rate, the big guns and the other paraphernalia of war shown here seem to have a strange sort of fascination for the average American sightseer.

The Krupp cannon is, of course, the big gun of the fair, but it is by no means the only big gun on the grounds. In the War Department of the Government Building is shown a number of them. One of these, and the largest, is a 12-inch breech-loader which carries a 1000-pound ball and requires 140 pounds of powder to the charge.

The Japs are a little race of people but all the same they are not to be sneezed at. Their magnificent display of art and pottery ware in the Manufacturers' Building shows them to be wonderfully ingenious and artistic workmen in this and many other fields of human endeavor.

A visit to the Convent of La Rabida gives one a good idea of the utility and comfort of a style of architecture but little used in this country. We refer to that style so prevalent in the most Oriental countries of building a house so as to form a court in the center. In those courts can be placed small gardens and fountains; and from the balcony running about the interior walls one has a beautiful retreat for rest and reading, or to enjoy the noon-day nap or a quiet pipe.



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## THE ELECTRICAL WORKER.

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The Chinese theater on the Plaisance is worth a visit. The inhabitants of the Flowery Kingdom are great actors in their own peculiar way; while a whole back-yard full of Thomas cats couldn't hold a candle to a full-fledged and well drilled Chinese orchestra.

The managers of the World's Fair should in these days of high winds and hot weather, see to it that the streets and thoroughfares of the grounds are kept thoroughly wet down. Last week much discomfort was caused to visitors on account of the streets not being kept sprinkled.

The Board of Managers of the Fair have decided to hold three fete nights each week, Tuesdays, Thursdays and Saturdays. On these occasions the grounds will be illuminated, the electrical fountains will play and all the buildings and exhibits will be kept open until 10 o'clock.

In the Government Building the department devoted to the exhibit of the United States Fish Commission is thronged with visitors all the day long. It is almost impossible to get near the hatching boxes, as people will stand and watch them for hours or until requested by the attendants to move on and give others a chance to see too.

Judging from their exhibit in the Transportation Building, the French people are well up in the front rank as locomotive builders. Two of their passenger engines shown here, are models of mechanical grace and strength; and from the size of their drivers should, on a good track, easily make a mile a minute.

The display of the woods in the Forestry Building, while yet incomplete, is very fine and promises well when all the exhibits are in place. Brazil, Trinidad, Japan, New South Wales and France are among the foreign countries that are making fine displays; while all of the timber States of our own country have sent the best and most complete exhibits their forests could furnish.

The new Esquimaux Village, which comprises something over five acres at the corner of Fifty-seventh Street and Stony Island Avenue, just outside the World's Fair grounds, will be opened to the public Saturday, May 27th, on which occasion special inducements to the public school children will be made to attend. This will be the first exhibition of the native Esquimaux, together with their wives and children, ever made in the United States.

The German exhibit was formally opened on Tuesday last, as was also the Imperial Building. Herr Bermuth, the Imperial Commissioner, who is about as disagreeable as the bitters which his name suggests, presided, and really unbent enough to do the honors with some show of cordiality toward his guests. Germany has, however, done herself proud at the World's Fair, and in every department of the great Exposition her exhibits are among those attracting the most attention and favorable comment.

British Guiana is not much of a manufacturing country, outside of its sugar industry. For years it has been an important factor in the dry hide trade, and annually sends thousands of them to this country, duty free. In return for this they take our boots and shoes, also without duty, and thus are supplied with the best made and most stylish footwear manufactured anywhere on the globe. —Chicago Business Register.

### The Distribution of Power from Niagara Falls.

Several schemes of a considerable magnitude are on foot for the utilization of the electricity furnished by the Niagara Falls Power Company. It is reported that a syndicate capitalized at \$4,000,000, has been formed for the construction of a line and the distribution of this power between Niagara Falls and Albany. It is also reported that a contract has been made with Rochester parties for supplying them with 25,000 horse-power, or such a part of it as is required as soon as the line can be constructed, and that propositions have been made to capitalists in different cities in the eastern part of the State for the same purpose.

### THE EDGE OF THE FUTURE.

#### Unsolved Problems That Edison Is Studying.

BY J. E. EDWARDS.

Thomas A. Edison, when he was congratulated upon his forty-sixth birthday, declared that he did not measure his life by years, but by achievements or by campaigns; and he then confessed that he had planned ahead many campaigns, and that he looks forward to no period of rest, believing that for him, at least, the happiest life is a life of work. In speaking of his campaigns Mr. Edison said: "I do not regard myself as a pure scientist, as so many persons have insisted that I am. I do not search for the laws of nature, and have made no great discoveries of such laws. I do not study science as Newton and Kepler and Faraday and Henry studied it, simply for the purpose of learning truth. I am only a professional inventor. My studies and experiments have been conducted entirely with the object of inventing that which will have commercial utility. I suppose I might be called a scientific inventor, as distinguished from a mechanical inventor, although really there is no distinction."

When Mr. Edison was asked about his campaigns and those achievements by which he measured his life, he said that in the past there had been first the stock-ticker and the telephone, upon the latter of which he worked very hard. But he regarded the greatest of his achievements, in the early part of his career, as the invention of the phonograph. "That," said he, "was an invention pure and simple. No suggestions so far I know, had ever been made; and it was a discovery made by accident, while experimenting on another invention, that led to the development of the phonograph."

"My second campaign was that which resulted in the invention of the incandescent lamp. Of course an incandescent lamp had been suggested before. There had been abortive attempts to make them, even before I knew anything about telegraphing. The work which I did was to make an incandescent lamp which was commercially valuable, and the courts have recently sustained my claim to priority of invention of this lamp. I worked about three years upon that. Some of the experiments were very delicate and difficult; some of them needed help which was very costly. That so far has been, I suppose, my chief achievement. It certainly was the first one which made me independent, and left me free to begin other campaigns without the necessity of calling for outside capital, or of finding my invention subjected to the mysteries of Wall street manipulation."

The hint contained in Mr. Edison's reference to Wall street, and the mysteries of financiering which prevail there, led naturally enough to a question as to Mr. Edison's future purpose with regard to capitalists, and he said:

"In my future campaigns I expect myself to control absolutely such inventions as I make. I am now fortunate enough to have capital of my own, and that I shall use in these campaigns. The most important of the campaigns I have in mind is one in which I have now been engaged for several years. I have long been satisfied that it is possible to invent an ore concentrator which would vastly simplify the prevailing methods of extracting iron from earth and rock, and which would do it so much cheaper than those processes as to command the market. Of course I refer to magnetic iron ore. Some of the New Jersey mountains contain practically inexhaustible stores of this magnetic ore, but it has been expensive to mine. I was able to secure mining options upon nearly all these properties, and then I began the campaign of developing an ore-concentrator which would make these deposits profitably available. This iron is unlike any other iron ore. It takes four tons of the ore to produce one ton of pure iron, and yet I saw, some years ago, that if some method of extracting this ore could be devised, and the mines controlled, an enormously profitable business would be developed, and yet a cheaper iron ore—cheaper in its first cost—would be put upon the market. I worked very hard upon this problem, and in one sense successfully, for I have been able, by my methods, to extract this magnetic ore at comparatively small cost, and deliver from my mills pure iron brickets. Yet I have not been satisfied with the methods; and some months ago I decided to abandon the old methods, and to undertake to do this work by an entirely new system. I had some ten important details to master before I could get a perfect machine, and I have already mastered eight of them. Only two remain to be solved; and when this work is complete, I shall have, I think, a plant and mining privileges which will out-rank the incandescent lamp as a commercial venture, certainly so far as I am myself concerned. Whatever the profits are, I shall myself control them, as I have taken no capitalist in with me in this scheme."

Mr. Edison was asked if he was willing to be more explicit respecting this invention, but he declined to be, further than to say: "When the machinery is done as I expect to develop it, it will be capable of handling twenty thousand tons of ore a day with two shifts of men, five in a shift. That is to say, ten workmen, working twenty hours a day in the aggregate, will be able to take this ore, crush it, reduce the iron to cement-like proportions, extract it from the rock and earth, and make it into brickets of pure iron, and do it so cheaply that it will command the market for magnetic iron."

Mr. Edison, in speaking of this campaign, referred to it as if it was practically finished; and it was evident in the conversation that already his mind turns to a new campaign, which he will take up as soon as his iron-ore concentrator is complete and its work can be left to competent subordinates.

He was asked if he would be willing to say what he had in his mind for the next campaign, and he replied: "Well, I think as soon as the ore-concentrating business is developed and can take care of itself, I shall turn my attention to one of the greatest problems that I have ever thought of solving, and that is, the direct control of the energy which is stored up in coal, so that it may be employed without waste and at a very small margin of cost. Ninety per cent of the energy that exists in coal is now lost in converting it into power. It goes off in heat through the chimneys of boiler-rooms. You perceive it when you step into a room where there is a furnace and boiler; it is also greatly wasted in the development of the latent heat which is created by the change from water to steam. Now that is an awful waste, and even a child can see that if this wastage can be saved it will result in vastly cheapening the cost of everything which is manufactured by electric or steam power. In fact, it will vastly cheapen the cost of all the necessities and luxuries of life, and I suppose the results would be of mightier influence upon civilization than the development of the steam engine and electricity have been. It will, in fact, do away with steam engines and boilers, and make the use of steam power as much of a tradition as the stage coach now is."

"It would enable an ocean steamship of twenty thousand horse-power to cross the ocean faster than any of the crack vessels now do, and require the burning of only two hundred and fifty tons of coal instead of three thousand, which are now required, so that, of course, the charges for freight and passenger fares would be greatly reduced. It would enormously lessen the cost of manufacturing and of traffic. It would develop the electric current directly from coal, so that the cost of steam engines and boilers would be eliminated. I have thought of this problem very much, and I have already my theory of the experiments, or some of them, which may be necessary to develop this direct use of all the power that is stored in coal. I can only say now, that the coal would be put into a receptacle, the agencies then applied which would develop its energy and save it all, and through this energy electric power of any degree desired could be furnished. Yes, it can be done; I am sure of that. Some of the details I have already mastered, I think; at least, I am sure that I know the way to go to work to master them. I believe that I shall make this my next campaign. It may be years before it is finished, and it may not be a very long time."

Mr. Edison looks farther ahead than this campaign, for he said: "I think it quite likely that I may try to develop a plan for marine signaling. I have the idea already pretty well formulated in my mind. I should use the well-known principle that water is a more perfect medium for carrying vibrations than air, and should develop instruments which may be carried upon sea-going vessels, by which they can transmit or receive, through an international code of signals, reports within a radius of say ten miles."

Mr. Edison believes that Chicago is to become the London of America early in the next century, while New York will be its Liverpool, and he is of opinion that very likely a ship canal may connect Chicago with tide water, so that it will itself become a great seaport. —McClure's Magazine.

### Decision on Fixture Patents.

An important decision has been made by Judge Coxe, of the United States Circuit Court, in reference to various Edison patents on fixtures, sockets, etc. The Edison Electric Light Company et al. brought suit against the Equitable Life Assurance Society for infringement of these patents. The Court, in giving its decision, remarked that inasmuch as the alleged infringement was commenced eleven years ago and had continued up to the present time, with no attempt on the part of the plaintiff to collect license fees, or an attempt to restrain the defendant, the Edison Company was not entitled to a restraining order or a permanent injunction.

## Electrolytic Corrosion of Piping System In the Neighborhood of Grounded Electric Circuits.

BY FREDERICK A. C. FERRINE, D. SC.

In our student days we were taught that the earth was always and everywhere at zero potential, so that the pole of our electric machine or battery which was "earthed" was at zero, and from the other pole there might be a fall or rise to that zero depending on whether we had connected the negative or positive pole of our system to the earth. We had, so, in the earth a great reservoir into which we might pour whatever electricity we could generate and, in a trice, all would be as before and our little effort swallowed up. Cables and telegraph lines were "earthed" in many parts of the world and the results obtained were so constant that the duplexing and quadruplexing system of telegraphing were only interfered with when some great electric storm might temporarily disturb the regions of the earth and air.

The little current of a telegraph cable which is sent from America to Ireland and then into the sea does not mysteriously find its way through the water of the ocean back to the battery where it was generated, but rather is transmitted by the fall of potential along the wire to the earth's zero at one end, from which zero it rises to the maximum of the battery at the further end. It is as though water had been pumped from some great reservoir and delivered at the further side back into the reservoir once more, keeping the level always constant, but not passing it in a cycle as though the same particles of water circulated through any continuous system of piping.

Some of our latest feats of electrical engineering have indicated to us, however, that we have placed too great a reliance in the power of the earth as a conductor capable of immediately equalizing the potential of great quantities of electricity continuously poured into it as a reservoir. The effect produced by our great grounded system of electric railroads seems to be as though our pipe taking from the reservoir and delivering to it again had been enlarged to such an extent as to produce eddies and currents in regions surrounding our suction and delivery pipes.

The electrician of one of our largest telegraph companies recently said to the writer that in many regions the whole earth had become polarized; and he narrated an instance where for several days a line between New York and Brooklyn had been operated without any battery whatever being used, simply by means of the earth's difference of potential at the ends of the line. A very happy state of affairs for the telegraph companies to be sure were it not that the electro-motive force between the two points was too irregular to admit of quadruplexing the wires, thereby reducing the capacity of the system and causing him to search in vain for that happy land of the telegraph engineer a "neutral earth."

Far more serious than this effect, however, is the report coming to us from Boston, and more recently from Los Angeles, Cal., that in these two cities the gas and water pipes have been attacked and rapidly corroded by the electrolytic action of the current leaving the rails of the electric railroad and seeking to fall to zero potential. Up to the present time the reports which have been published lack too many points of scientific detail to throw a complete light upon this serious question and enable us to determine definitely the manner of the action in such cases and point out a sure remedy.

In several instances the fall of potential through the earth has been measured, and reports have been received of there being the astonishing electromotive force of forty-five volts between the earth at Harvard College and in Boston. Indeed, it is reported that enough current was flowing over a certain section of water pipe which crosses the Charles River to produce an arc between two sections and set fire to the okum with which workmen had been packing a joint.

Even in New York, where the amount of electricity generated by the railroads is comparatively insignificant, there is often as much as ten volts difference of potential between an earth at Harlem and one in the heart of the business portion of the city, while on crossing to Brooklyn, the potential difference to lower New York is often still greater.

In Los Angeles, Cal., there occurred last February two cases of the corrosion of water pipes near the power house of the electric railroad, and as one case of trouble arose with a galvanized iron pipe, laid but a short time, an investigation was made which seemed to lead to assigning an electrolytic cause for this action.

Such electrolysis may occur in two ways, depending upon the location of the pipe, and the manner of grounding the electric system. It may be either between the pipe and the rails, or other conductor,

to which the current is passing, or it may be of the nature of a local action between two sections of a pipe which is itself carrying current.

Taking the ordinary case where the negative pole of the dynamo is connected to the trolley and the positive connected to the rails, and any neighboring streams or wells, the course of the electricity will be partially as a direct fall to zero potential where the pole of the dynamo is connected and partially a fall along the rails, and any other conductors in the neighborhood, to the various motors along the line. In such a case concussion may occur whenever a near-by water pipe faces the rail or ground feeder of the railroad, since there is a fall of potential from the earth to the trolley wire, which is negative, and the water pipe will act as the positive plate in an electrolytic cell, being corroded accordingly.

Should the water pipes be connected with the dynamo at the station, as is very often the practice, there will be a considerable flow of current along them which, being delivered from the pipes to the rails and track feeders, will increase the action already described, because by reason of this direct connection with the dynamo, the pipes will deliver a greater proportion of current than where the dynamo is simply grounded in wells or streams. Besides this action there is also in both of these cases a possibility of a considerable amount of concussion from the fall of potential along the body of the pipe itself, making it possible for two parts of the pipe to act as anode and cathode as well as a further action from the escape of considerable amounts of current where the pipe makes contact with moist earth after a considerable length has been insulated.

By reversing the connections to the dynamo the electrolytic action in such cases will be somewhat lessened, since now the current passing out over the trolley is delivered by the rail and track feeders to the neighboring pipes and the track system of the road will suffer rather than the piping. But even in this case all the current which passes from the pipes to the earth and does not pass along them to the power station will have the same power of corrosion as before, but on the opposite side, while that flowing along the pipe will have an undiminished power of local action, such as is described above.

When the grounding is done as we have described, it seems impossible by any method of connection to prevent any possibility of electrolytic action on neighboring iron pipes running in water or moist earth.

A more complete system of grounding seems, however, to offer at least a partial solution of this difficulty, which may only be completely worked out in a careful study of the special condition in some particular case.

For such a complete system of grounding, in order to reduce to a minimum electrolytic corrosion, the negative pole of the dynamo should be connected to the trolley and feeder line; then at the station connections ought to be made not only with the rails and wells, but also with all water and gas pipes, which piping system should also be frequently connected to the track and track feeder, so that whatever current passes by the medium of these pipes should flow out of the earth into them, and thence to the rails by the means of metallic and electrolytic conduction. If this be completely accomplished there can be no corrosion of the pipes caused by the current flowing out of the pipes to the rails, and the only corrosion possible will be that due to the local action caused by the difference of potential along the pipes themselves.

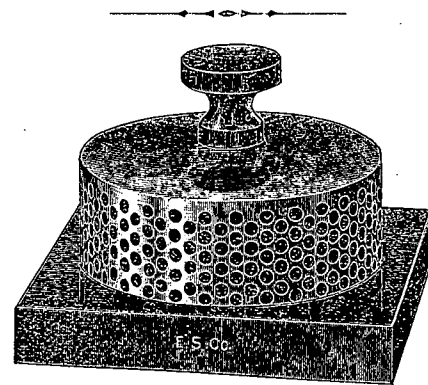
This may also be reduced by joining the various systems of piping in many places, and as a last precaution, the potential difference between various portions of the grounded system should be ascertained and reduced to a minimum by the means of auxiliary, partially insulated conductors laid between these points, and of sufficient size to equalize the difference of potential. Such a complete system of grounding will, undoubtedly, prove to be a considerable item of additional expense in the installation of any electric railroad or other grounded electric system; but as it is not at all unlikely that the courts may ultimately decide that such systems are liable for damages produced by their straying currents, and as it would undoubtedly affect a considerable saving in the loss of power now represented by the imperfect conduction of the ground system, it would seem that the investment necessary for such a return circuit would ultimately, yield a handsome return upon the necessary outlay.

—*Electric Review.*

## Tesla's Patents.

Two suits have recently been entered by the Westinghouse Electric Company against the Thomson-Houston Electric Company, a corporation of Connecticut and a member of the General Electric Company, for the infringement of a number of patents granted to Nicola Tesla, and to restrain the operation of a plant near Hartford, Conn., involving the multiphase distribution of electricity covered by Mr. Tesla's patents, which are now owned by the Westinghouse Company.

It is claimed for the Tesla patents that they broadly cover all systems for the distribution of multiphase currents of electricity for power purposes, and the fact that the Thomson-Houston and General Electric Companies are, in their operations, making copies of the Westinghouse Company's apparatus, together with the fact that these patents have heretofore been fully respected and acquiesced in by all parties, strengthens the position of the Westinghouse Company. Efforts will be made by the Westinghouse Company to have these suits brought to a final hearing during the present year. A successful termination of these suits will mean that the only practical method of transmitting power over long distances by means of multiphase alternating currents of electricity will be entirely controlled by the Westinghouse Company, a branch of the electrical business that will in the near future require more electrical apparatus than any other.



The Wirt Lamp Regulating Switch.

This switch which is manufactured by the Ansonia Electric Co., controls the electric light "the same as gas." It can be put in place of an ordinary switch, and is as easy to control and as simple to operate. The principle is entirely different from that of any other device of its class. Its operation is such as to leave nothing to be desired in the way of convenience and perfect action. It is intended to control a single light, and will be found particularly advantageous for bedrooms, nurseries, etc., and in fact in all places where a light that can be graduated is desired.

## The Telegraph in China.

Mr. Charles Denby, Minister of the United States in Peking, China, reports to the State Department, under date of March 4, last, that the Chinese land telegraph line has been joined to the Russian system. Messages can now be sent to any part of the world from any telegraph station in China.

Since this connection was made the cable companies have added 15 per cent to their charges, but messages may be sent over the Chinese lines at the former rate—\$2 per word, the cost of transmission across the Atlantic being added.

The service is rapid and satisfactory. Parties sending messages have the right to designate whether they shall go over the cable lines or the land lines.

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Jun 1893

### La Roche New Alternating Dynamo.

The cut herewith represents one of the types of alternating machines built by the well-known La Roche Electric Works of Philadelphia. The above company was one of the first in America making a specialty of alternating apparatus. The demand for their alternating machines has been so great that they were compelled to make up a full line of small alternators, and now build same with a frequency of 16,000 revolutions and from 25 up to 3000 lights. The La Roche machines are well known throughout the United States and Europe. They have been very successful with these machines, which are made in two classes—self-exciting and non-exciting.

The machines from 25 lights up to 500 lights are arranged with ten poles running at 1600 revolutions, thereby giving a frequency of 16,000 per minute. The larger machines, of course, have more poles and give the same frequency, but at a lower speed. The alternators have all modern improvements, with all parts interchangeable and made to gauge; they have been designed by Mr. A. La Roche. They have self-oiling bearings and an automatic oil-overflow. The brush-holders are of a new design, and so made that any degree of tension can be secured. The machine, of course, has no commutator, but has two collector rings which are made of specially hardened copper, well insulated with mica. The fields in even the smaller machines are made separable, so that any repair work can be done without interfering with balance of the machine.

The field bobbins are separately wound and slipped over the core, and any of them can be replaced, in case of necessity, in a very few minutes. The armature is built up of the best laminated, pure charcoal iron, well magnetically insulated. The core is mounted on two of the La Roche latest bronze spiders, well screwed to polished steel shaft. The shaft is turned down where entering bearings to standard size. The armature coils are separately wound and any intelligent person can replace any or all in a very few minutes, as this company has a new method of securing the coils to the core. They also have a new and improved method of connecting and winding the armature, whereby the difference of potential between coils never exceeds 200 volts, while in machines of other systems now in use, the difference of potential between coils is from 500 to 1000 volts. By the La Roche system it is almost an impossibility to have a burn-out or short circuit from lightning. The coils are insulated from the core of the armature by the best grade of mica that can be procured. It will be noticed that the above cut is not of the self-exciting type, neither is the exciter attached in this illustration.

At a test of some of these machines it was shown that there was a variation of only 2 3-10 volts between no load and full load, which is a sufficiently close regulation for any alternating machine.

This company has placed alternators with such well-known concerns as the University of Wisconsin, Messrs. Queen & Co., Philadelphia, Helios Electric Co., Philadelphia, etc., and they can show flattering testimonials from all parties using their system.

All the machines have a cast-iron sub-base, well secured and mounted, so that no foundation is required, as the sub-base answers that purpose.

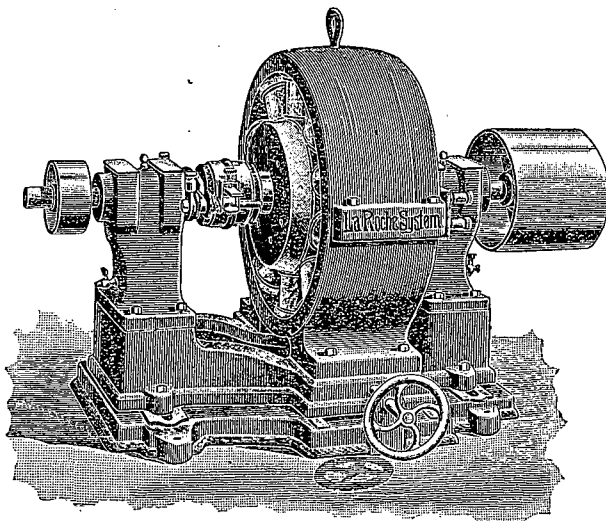
The La Roche Company is to be congratulated upon the success of not only its alternating system, but also its direct current and arc system. It is one of the most flourishing companies of the kind in this country, and has grown to its present magnitude from a small room, 8x12, and this has been largely due to the energy and ability exhibited by their Mr. F. A. La Roche. The La Roche Electric Works will, in a short time, remove to their new factory, which will be one of the largest of the kind in this country.

### Electricity vs. Steam.

The recent performance of the Empire State Express of the New York Central, which ran at the rate of ninety-five miles an hour for ten consecutive miles, has greatly interested mechanical engineers and scientific men generally. This remarkable record is expected to have a very important bearing upon railroad schedules of the near future, and is especially interesting at this time, when extraordinary efforts are being made to reduce the time between distant points by means of electricity. Until lately eighty miles, or perhaps eighty-three, had been the fastest time made by any railroad, and this speed of ninety-five miles an hour by a complete train weighing in the neighborhood of 200 tons, and running over different grades, throws new light upon the question of attainable speeds, and gives some data from which to work and figure for the future.

Experiments in propelling canal boats by electric power are to be made on the New York State canals, the Legislature having appropriated \$12,000 for that purpose.

An explosion of a storage battery cell in New York occurred recently under peculiar circumstances. Seven Julian cells, in process of being charged with a 10-ampere current at 110 volts, were disconnected while in circuit in order to put in another cell. At the instant the connection was broken there was a vivid flash, followed by a loud explosion. The middle cell was completely wrecked, and several persons standing near were thrown back and covered with acid. The explosion was due to the spark caused by breaking the circuit igniting the uncombined hydrogen and oxygen gases in the cell.



LA ROCHE NEW ALTERNATING DYNAMO.

### Look Inside Your Watch.

Open your watch and look at the little wheels, springs and screws, each an indispensable part of the whole wonderful machine. Notice the busy little balance wheel as it flies to and fro unceasingly, day and night, year in and year out. This wonderful little machine is the result of hundreds of years of study and experiment. The watch carried by the average man is composed of ninety-eight pieces, and its manufacture embraces more than 2000 distinct and separate operations. Some of the smallest screws are so minute that the unaided eye can not distinguish them from steel filings or specks of dirt. Under a powerful magnifying glass a perfect screw is revealed. The slit in the head is 2-1000 of an inch wide. It takes 308,000 of these screws to weigh a pound, and a pound is worth \$1585. The hair-spring is a strip of the finest steel about 9½ inches long and 1-1000 inch wide and 27-10,000 inch thick. It is coiled up in spiral form and finely tempered. The process of tempering these springs was long held as a secret by the few fortunate ones possessing it, and even now is not generally known. Their manufacture requires great skill and care. The strip is gauged to 20-1000 of an inch, but no measuring instrument has as yet been devised capable of fine enough gauging to determine beforehand by the size of the strip what the strength of the finished spring will be. A 1-20,000 part of an inch difference in thickness of the strip makes a difference in the running of a watch about sixteen minutes per hour.

The value of these springs when finished and placed in watches is enormous in proportion to the material from which they are made. A comparison will give a good idea. A ton of steel made up into hair-springs when in watches is worth more than twelve and one-half times the value of the

same weight in gold. Hair-spring wire weighs one-twentieth of a grain to the inch. One mile of wire weighs less than half a pound. The balance gives five vibrations every second, 300 every minute, 18,000 every hour, 432,000 every day, and 157,680,000 every year. At each vibration it rotates about one and one-fourth times, which makes 197,100,000 every year. In order that we may better understand the stupendous amount of labor performed by these tiny works, let us make a few comparisons. Take, for instance, a locomotive with six-foot driving wheels. Let its wheels be run until they have given the same number of revolutions that a watch does in one year, and they have co-terminated equal to twenty-eight complete circuits of the earth. All this a watch does without other attention than winding once every twenty-four hours.—*Locomotive Eng. Mag.*

### Depths of Space.

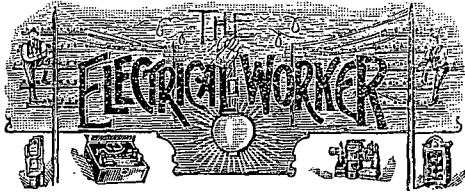
In his last lecture to juveniles at the Royal Institution in London, Sir Robert Ball said that a telegraphic message would go seven times around the earth in a second, and, if a telegraphic message could be sent to the moon it would reach its destination in a little more than a second. It would take something like eight minutes to arrive at the sun; but how long did they think it would take to get to Alpha Centauri, traveling thither at the rate of 180,000 miles a second? Seconds, minutes, hours, days, weeks, would not be long enough; it would take not less than three years, traveling all the time at that tremendous pace, before it would reach its destination.

If that was the case with respect to the nearest of the stars, what must be said of those which were farther off? There were stars so remote that if the news of the victory of Wellington at Waterloo had been flashed to them in 1815, on that celestial telegraph system it would not have reached them yet, even if the message had sped at the pace which he had indicated, and had been traveling all the time.

There were stars so remote that if when William, the Conqueror, landed here in 1066, the news of his conquest had been dispatched to them, and if the signals flew over the wire at a pace that would carry them seven times round the earth in a single second of time, that news would not have reached them yet. Nay, more; if the glad tidings of that first Christmas in Bethlehem 19 centuries ago, had thus been disseminated through the universe, there were yet stars, of which astronomers could tell them, plunged into space in depths so appalling that even the 1892 years that had elapsed since that event would not have been long enough for the news to reach them, though it traveled at 180,000 miles in every second.

NEW YORK CITY has now about 287 miles of electrical underground mains, of which 172 miles belong to the Edison Electric Illuminating Company, which uses the low-tension system, while forty-five miles of subway carry telegraph and telephone wires, leaving seventy miles for high-tension lighting currents. The Edison low-tension wires are of copper wound with rope and placed in an iron pipe, which is then filled with an insulating compound of Trinidad asphalt, resin, paraffin and linseed oil. Each pipe contains three conductors, is about twenty feet long and is laid in shallow trenches, the connections being made in coupling boxes. Of the other systems the most satisfactory form of conduit for the wires is a simple iron pipe embedded in concrete. In the high-tension systems, where lead-covered cables are used, the workmen handle the cables without accident, although a full current may be passing through the mains at the time. The lead coating is said to form an excellent "ground," and thus all danger to the workman is avoided. The principal accidents have arisen from the leakage of gas from the gas mains into the subways, owing to which many explosions have occurred. To avoid this artificial ventilation has been adopted, a slight pressure being maintained in the conduits by means of twelve Root blowers. This method has been successful in preventing large accumulations of gas; but the proper remedy, according to electricians, is for the gas companies to keep their mains in proper order. The principal difference found in working with overhead and with underground conductors is that the latter work better in stormy weather.

INVENTION is sometimes thought to have reached its limit, but of the energy in a pound of coal when burned only 1 per cent is used in moving a passenger and only one-half of 1 per cent in incandescent electric lighting, the rest goes in friction and waste. The problem of the next century is going to be the saving of this wasted 99 or 99½ per cent, just as the problem of the last century has been to secure the use of 1 per cent which moves trains and the ½ per cent which makes an electric light.



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#### SUBSCRIPTION. \$1.00 PER YEAR IN ADVANCE.

As THE ELECTRICAL WORKER reaches the men who do the work, and recommend or order the material, its value as an advertising medium can be readily appreciated.

St. Louis, Mo., June, 1893.

Advertising Rates on Application.

The columns of the Electrical Worker are open to all members, and we should like to hear from as many as possible. We should have more articles on practical electrical subjects. We have ability enough in our ranks, and if our members would only take the time and trouble to write what they know about the various subjects, we would soon have to enlarge our paper.

Within the last few months there have been over a dozen deaths among the electrical workers of the United States, caused by coming in contact with live wires. Some of them were suspended members, and their families were thus deprived of the benefit they would otherwise have received. This should be a lesson to all our members to keep their dues paid up, so that if an accident should happen, those who are dependant on you will be provided for.

#### Read This.

Local unions should insist upon their press secretaries sending in a monthly article to the ELECTRICAL WORKER and should impress upon their minds that the 10th day of each month is the latest limit for receiving correspondence at the office of the ELECTRICAL WORKER. Up to date the press secretaries have been sending in their letters at any or all times or not at all, as their fancy suited. For the May issue we received correspondence from several of the larger locals just as we were in press, and as a consequence they were too late for the May number and their news is too old for June. Press secretaries will greatly oblige by pasting this where it will jog their memory.

As the time is now at hand for the regular semi-annual election of officers, we hope that our brethren will use good judgment in their selection of officers. They should put personality and friendship aside and elect only men who are thoroughly qualified for the different offices. The president should be a man of good executive

ability, with at least a fair knowledge of parliamentary usage, and who has the courage of his convictions.

The next most important office is that of financial secretary. Not only has he to keep the accounts of each member and the account of his union with the General Office, but he must also use great tact in collecting dues. Many a member who falls in arrears and is suspended could easily be saved to the union by a little effort on the part of the financial secretary.

The recording secretary is also a very important officer. We would ask how many unions have a correct record of all their meetings entered in a neat manner in a record book. We have attended meetings where certain questions came up which some member claimed had been acted on at previous meetings. When the recording secretary was called upon he could give no light on the subject.

The last addition to our list of officers—the press secretary—is one of the most important of all, and requires special ability. It is through him that the outside world knows of his union and judge it according to his reports. The press is the greatest power of modern times and the mold of public opinion. A member may make a good kick and score a great point in the meeting, but only a few are benefitted by it, but when the press secretary makes a kick and advances good argument thousands are benefitted.

#### Sunday at the Fair.

Our esteemed neighbor, the "Inland," the official organ of the Christian Endeavorers, is out in a double-leaded editorial tirade against Sunday opening of the World's Fair.

We have great respect personally for Bro. Alden, the able publisher of the *Inland*, but we rather think he is looking at the fair through jaundiced spectacles. Our esteemed and religious brother seems to think that the Christian Endeavorers are the sole inhabitants of these United States and that they are the only taxpayers and only owners of the Government and all thereunto appertaining. He seems to forget that the Christian Endeavorers are a very small minority of the 65,000,000 of inhabitants of this Republic. All told, there are less than 10,000,000 professing Christians in our beloved country, and about seventy-five per cent of these are in favor of Sunday opening; the small balance of religious cranks, composed mostly of long-haired men and short-haired women, are the howlers for Sunday closing. During the three years that the fair was in the course of erection, these self-same Pharisees never said anything about the workman being employed on Sundays, but as soon as the work was completed they make a great howl and deny the laborer a chance to view the results of his handiwork. This may possibly be *modern religion*, but is not the *religion* that was preached on the Mount. The Golden Rule has given place to the Pharisee's: "I thank Thee, O Lord, that I am not as wicked as my brother."

Since writing the above we have received news of the unanimous decision of Judge Fuller and associate judges that the fair shall be opened on Sunday, and now the "howlers," these self-righteous "would-be holier than thou" individuals threaten to boycott the fair, and in their petty spite would withdraw their exhibits. This the Director General will not permit as he has already notified some exhibitors who would have withdrawn, that they can not do so; their exhibit must remain for the full term of the fair. In regard to keeping away from the fair, many of these Pharisees will do the same as they do about drinking, they will slip in on the quiet through the side door and if met by the undersigned we can assure them they will hear from us.

To Bro. Alden, the *Inland et al.*, we will therefore say *au revoir*.

THE BUZZER.

#### July Brotherhood Elections.

Ere our next number goes to press the local unions will have had their semi-annual elections. The result of these elections should be sent into our office at as early a date as possible so that we can have time to correct our directory list in the July number. Local unions will please see to it that we receive this information certainly not later than July 12th, and as much earlier as possible.

#### Corrections.

In our May number in an article entitled Electrical Display at the World's Fair, we inadvertently copied an extract from the *World's Fair Electrical Engineering Magazine* without crediting that journal for it. The article came to us from a press clipping without a credit. We are always willing to give credit where credit is due and take this opportunity to do so to the *World's Fair Electrical Engineering Magazine*.

Owing to some unavoidable mishap in the composing room, the very able and seasonable article, written by Bro. Tuttle, was misplaced or lost. We hope the brother has kept a copy of the article, as we are very desirous to put it in print.

#### NOTICE.

We have many complaints (especially in large cities) from brothers who do not receive their papers regularly, and in many cases the post offices notify us that the party to whom addressed can not be found. Brothers will please notify us of any changes of address, and should also inquire at post office occasionally as we are sorry to say Uncle Sam is not over particular in his distribution of second-class mail matter.

Luminous effects of currents with high frequency were shown at the Royal Society soiree by Sir David Salomons and Mr. L. Pyke in a darkened room. Those were produced by transforming machines with a frequency of 1,000,000 alternate discharges per minute—an amazing practical achievement, which puts in the shade the beats of an insect's wing and suggests the undulations of light. One of these machines is described as "a compound of two electric motors whose armatures revolve in different directions. On the end of one armature is the magnetic field of the transforming apparatus, and on the end of the other the armature thereof, there being as many as 350 poles. With a primary current of forty amperes supplied at 100 volts, the machine gives out its new current in the shape of only two amperes at 200 volts, but of a frequency of 1,000,000 alternations per minute. It is found that above 80,000 alternations no better results are obtained by increasing the frequency. A beautiful set of vacuum bulbs and tubes were by these appliances maintained in an intense phosphorescent glow sufficient to produce the necessary light due to the current originally employed without any carbon filaments inside the bulbs." These experiments open up vast fields of practical application to the inventor. Is the time at hand when houses and public buildings will be illuminated without the risks of wires carried to every light? Will the phosphorescent glow take the place of the incandescent filament?

THE most knowing man in the course of the longest life will always have much to learn; and the wisest and best, much to improve.—[Shaftesbury.]

MANY do with opportunities as children do at the seashore: they fill their little hands with sand and then let the grains fall through, one by one, till all are gone.—[T. Jones.]

HE who, when called upon to speak a disagreeable truth, tells it boldly and has done, is both bolder and milder than he who nibbles in a low voice, and never ceases nibbling.—[Lavater.]

IF a crooked stick is before us, you need not explain how crooked it is. Lay a straight one down by the side of it and the work is well done. Preach the truth and error will stand abashed in its presence.—[Spurgeon.]

When you visit Chicago do not forget to call on the old-time friend of electrical workers, John E. Fitzpatrick, 204 Washington street, Chicago.



JUN 1893

### Taking an Interest.

It is curious to notice how many things there are in which people frankly acknowledge that they take no interest. The earnest reformer, the ingenious inventor or the enthusiastic philanthropist, feeling charged with a message to the world which he tries to deliver, or a boon which he longs to give, meets no obstacle so hard to overcome as this want of interest. Objections may be answered, difficulties may be surmounted, even antagonism may be overcome, but the indifference which cares neither to hear nor to reply, neither to assent nor dissent, is the barrier hardest of all to break down. Many persons plead this lack of interest as an excuse for total ignorance on subjects occupying the thought and attention of others. When asked their views on political or social problems, on some recent discovery of science, or a noted work of art, or some important contribution to literature, they confess that they have never been able to take any interest in the subject at hand, and, therefore, have no opinion to offer. That they never have taken any interest in it, is true, but that they were not able to do so, is, in most cases, a delusion. The chief reason why people take no interest in a subject is that they know little or nothing about it, having taken no pains to inform themselves. Interest is not the cause, but the result of knowledge. There is no inherent incapacity in any normally intelligent person which prevents him from taking an interest in any subject; and, on the other hand, be he ever so intelligent, there is no subject in which he can be interested until he has learned something about it; and the degree of interest will usually be determined by the degree of knowledge.

Of course, the different tendencies of people will induce them to assimilate some kind of knowledge with more ease and pleasure than others; but there is no actual interest in anything until some knowledge of it is gained. It will be said that life is too short and work too urgent for a busy person to learn enough of many things to take a real interest in them; and this is, to a great extent, very true. It is undoubtedly the first duty of each man and woman to be thoroughly interested in his or her own special business, and to that end to cultivate all possible acquaintance with the various parts and to trace their relation to the whole. Even this is by no means always done. Hundreds of people are to-day pursuing occupations in which they feel but little real interest beyond the pecuniary gain which their labor brings. No really excellent work can thus be performed. Let them not say they do their duty, though without any pleasure. It is one important part of their duty to take pleasure in it, and this is never impossible. Let such a one take pains to find out all he can of his pursuits; how his part blends with others; the effect aimed at by the whole; how most perfectly to compass that effect; what better, swifter or easier methods he can employ than he now uses; let him take some time, outside of his work, to read of its history and its improvements, to think of its possibilities, to talk of its future; let him do this perseveringly, and the interest which was so weak will intensify grow, his energy will increase, his work will become more valuable, and his character will be elevated. Whoever does this conscientiously will generally find other things also which claim his attention. Family, friends, education, social problems will appeal to him for judgment, and often for active effort. He must, of course, decide for himself what subjects demand his attention and what lies outside his range, but he will no longer plead want of interest as an excuse for idle neglect. Whatever appears to him to have vital importance, whatever he is conscious he could aid by thought, or word, or deed, he will feel in honor bound to take an interest in, and, therefore, he will no longer live in contented ignorance concerning it. If we are thus responsible for taking an interest in things that deserve and claim it, we are also responsible for awakening an interest in the minds of others, especially the young. This is a work much overlooked by parents and teachers. If they succeed in making their young charges do certain things, and avoid certain others, learn given lessons and obey certain rules, they are too often satisfied without much effort to arouse an interest in what is thus done or learned. Whoever studies the nature of children will perceive how much interest they take in matters that they fully understand, and call forth their faculties. Watch the growing curiosity of the infant playing on the floor with a simple toy, or look at a group of little ones in the open air developing their faculties by the various games of which they never grow weary. There is interest enough and effort enough; and could we but imitate Nature in our methods of education, working slowly but thoroughly, arousing the curiosity and imagination, quickening the intelligence, stirring the sympathies, guiding the desires, inspiring and elevating

the thoughts as earnestly as we now strive to restrain or induce special action, we should reap a fuller harvest from our efforts. A recent writer on education, speaking of the steps to the highest culture, says: "The last and highest is that of teaching the pupil that he can will himself to take an interest in whatever he pleases. Many great scholars never discover that they have such a power. And yet the whole history and tendency of civilization lead to it."—*Locomotive Engineers' Journal*.

### The Sunday Excursion Train.

Written expressly for the Electrical Worker.

BY ONE OF THE BOYS.

We stood on the switch at midnight  
And waited more than an hour,  
To let the limited hog train pass,  
At Frogtown Water Tower.

Along the dimly lighted car  
The weary passengers lay,  
And a few wild hoodlums roamed about  
And were acting over-gay.

And "after the ball is over,"  
In tones that would split your ear,  
And the croaking of the bull-frogs  
Were horrible sounds to hear.

Not quite as loud, but just as bad,  
Came discords on the guitar;  
Where the bicycle riders were lounging,  
On the floor of the baggage car.

For the train was full of people,  
And lots of people to spare,  
And some of the fullest people  
That ever I saw, were there.

How often, Oh, how often,  
I thought what a jay I am,  
To leave the quiet city  
And get into such a jam.

For I was tired and dusty  
And my head was full of pain,  
And the racket was simply awful  
On that Sunday Excursion Train.

At last the hog-train passed us  
And we started for home again,  
And for seven miles were followed  
By two evil looking men.

They kept so close behind us,  
Walking with might and main,  
It seemed as if they were trying  
To catch us and rob the train.

But when they came aboard we saw  
They were only two of the boys,  
Who preferred to walk a little while  
To get away from the noise.

\* \* \* \* \*  
And forever, and forever,  
As long as the river flows,  
I'll keep away from such rackets  
No matter a cuss who goes.

J. E. R.

Editor Electrical Worker:

I have often been pained to witness the conduct of some linemen, while on duty, in yelling at people as they pass along the streets. By their impolite and insulting remarks they bring reproach upon our craft. No merchant or tradesman would keep in his employ for one moment any man guilty of such things, and we don't believe there is an electrical company in the country that would condone such actions if they were brought to their attention. I speak from personal knowledge and observation, and hope by this simple statement of facts to correct, to some extent at least, the evil referred to. The men now engaged in electrical work are the pioneers in what is destined to be the greatest scientific development of the age, and every man engaged in the work should honor the same by a life of sobriety, honor and manly conduct.

DUNFER.

### Personals.

Col. Donald Howard Farquhar, of the New York Scientific Society, was a welcome and entertaining visitor at our sanctum last week. He is patenting several inventions that will make a sensation in electric and railroad circles.

Fred Einstein, the irrepressible multi-secretary of a dozen different companies, finds time to experiment and is about to file a caveat for a patent electric fly trap and exterminator which he intends placing on the market at cost price. Fred is a genuine philanthropist and cares more to benefit suffering humanity and "lay up riches in heaven," than to swell his already plethoric bank account.

Louis Nahm of the Electric Club, is very busy during working hours manufacturing incandescent lamps, but since the club has practically shut down o'night during the dog days and mosquito nights, he puts in a few hours in balloon making and "will fly through the air with the greatest of ease" long before the Lucas Air Ship is in shape to carry passengers or mail.

### TRADE NOTES.

Sutter & Hisserich have moved to 904 Pine St., and are busy writing up contracts for wiring residences. For the short time that they have been in business they have been doing remarkably well.

A very neat little pamphlet has recently been issued by the Ansonia Electric Co., descriptive of the W. W. Lightning Arrester, which ought to be of interest to every station superintendent or manager.

Those station managers, who realize the value of standardized fuse wire, may be interested to know that the Wirt fuse wire handled by the Ansonia Electric Co., formerly the Electrical Supply Co., is standardized wire.

The Home Novelty Manufacturing Co. of Tenth and Walnut Sts., St. Louis, are doing a big trade in electrical novelty specialties and are very busy filling orders for their pillar and ceiling fans which are considered the best in the market.

The large sales which the Ansonia Electric Co., formerly the Electrical Supply Co., are making of Shield Brand wire, Stanley Transformers and Helios Lamps, would tend to prove that it is a combination which operators of plants think very highly of.

The Wirt regulating switch, used for dimming incandescent lights, particularly for use in bedrooms and nurseries, seems to be particularly popular, as two different papers have written to the Ansonia Electric Co., the manufacturers, for electrotypes, as they wished to illustrate it in their papers.

A. C. Wolfram, North Ninth St., St. Louis, is happiest when the weather is warmest and he has good reason to be so, as the hotter the weather the more fans he puts up. He is a pioneer in the fan business and until lately had it all his own way. He reports general electric business as flourishing and contracts coming in lively.

Messrs. Eicks & Robinson, patent experts, have moved into their new and handsome office, room 529 Odd Fellows' Building. They are both young men and it is a conceded fact that the young men in business do the best work in order that their future success will be assured. They have lately opened an office at 320 Missouri avenue, East St. Louis, for the convenience of their east side clients.

Ed. Morrison, carrying traveling card from No. 9, is very much wanted in Chicago and St. Louis. In the former city he obtained \$2.50 from a candidate and left the city with board bills unpaid. In St. Louis he stole a complete set of tools from a brother and stuck his partner for a week's board. He is said to be heading for Indianapolis, and all Unions and Union men are hereby cautioned to beware of him.

## CORRESPONDENCE.

[The Press Secretary, though an officer of the Local Union, is really a resident correspondent of the *ELECTRIC WORKER*, and should keep his paper thoroughly posted on all matters pertaining to the electrical industry in the vicinity he represents. New plants, extensions of old ones, new electric roads, state of trade, new ideas, electrical novelties and accidents are a few of the topics to report on. Please notice that the minutes of the meetings are not required, except the report of new officers, and such matter as may be of general interest to all members.]

ST. LOUIS.

June 10, 1893.

*Editor Electrical Worker:*

I came very near forgetting the *ELECTRICAL WORKER* this trip as I am chuck full of sign-painting for our 4th of July picnic. I believe all the arrangements are complete for the picnic, and from the interest taken in it by the boys its success is assured. Quite a number of donations of handsome presents from prominent firms will be awarded to the successful competitors in the different racing and other contests. The 60-foot pole-climbing contest will prove very attractive to all members of the N. B. E. W.

Quite a sad accident happened on Saturday, June 3, by which Pat Shey lost his life. I did not get full particulars of how it happened, but I understand he was working with the trolley wire and came in contact with a grounded guard wire. Be that as it may, he was knocked from the ladder and instantly killed. Pat was not a member of the brotherhood but had declared his intention of joining soon.

Another unfortunate affair was the killing of ex-Bro. S. G. Love, which was one of the most horrible deaths that has yet occurred among the linemen, and which has been written up so graphically in almost every paper in the land, that it is unnecessary to enlarge upon it. This latter case should also impress on all members of the brotherhood the necessity of paying up their dues, so that in case of an accident they will receive whatever benefits they may be entitled to.

With preparations for the picnic and for the July elections, we are pressed for time, so, with a cordial welcome to all brothers for our 4th of July spread, we remain fraternally,

W. B. BOWLIN,  
Press Sec.

*Editor Electrical Worker:*

The Press Secretary of No. 1 was instructed by the local union to congratulate Brother Kelly, through the *ELECTRICAL WORKER*, on his recent marriage, and also thank him for the entertainment he provided the members of No. 1 on the occasion of his wedding. Brother Kelly, our grand secretary-treasurer, is one of the most popular members of the brotherhood. A sign of his popularity with the members around the country, may be shown by his re-election as grand secretary-treasurer, by a unanimous vote of men that he had never seen before. The brothers of No. 1 wish him success and prosperity, and that he may long remain at the helm of our organization. No. 1.

*Editor Electrical Worker:*

Some of the Bros. in the local U. around the country may think that No. 1 is not up to date with other L. U. started six months or a year after. To dispell that idea I will tell them something about our L. U. We have about doubled our membership since the first of the year. We embrace not only linemen and wiremen, but every other branch of the electrical business, trimmers, both commercial and city, dynamo tenders, inspectors, electrical contractors, etc., etc. But the main reason for this increase in membership is, that we have struck the right road to success. We

have taken hold of the educational feature of our constitution. There, brothers, is the key to success. Another thing is, that we take a mutual interest in each other, one brother's wrong is every brother's wrong. Through the thorough knowledge that our worthy President Lafferty has of the ability of the members, we attain good results from all committee work. When he appoints a committee he knows that whatever the committee was appointed for will be done and done well. This is clearly shown in the preparation for our annual picnic, which is to be held the national birthday, the glorious Fourth of July. The programme of amusements gotten up by the committee is one of the best ever gotten up by any organization. The principal event, of course, to the brothers will be the climbing contest, for which the first prize offered is a pair of nickel-plated Eastern spurs donated by the Commercial Electrical Supply Company—the company that is not always “just out” of the different kinds of supplies. The second prize is a gold badge of the brotherhood, donated by our G. S. and T., J. T. Kelly. The other five that have donated prizes and whose names the brothers must not forget are: Fair Clothing Company, represented about three times, Loth Jeans Clothing Company, D. A. Pereira, the well-known clothier of the linemen of St. Louis; Harris-Bruner Shoe Company, Louis Boulter Shoe Company, Weil Furnishing Company, Famous Shoe and Clothing Company, and J. Bruner, Harry Kaltenbach, J. Cafferatta, J. McDermott, C. H. Krass, J. D. Smith and others have contributed cigars and refreshments as prizes for different events. There is only one, or rather twenty, prizes which the Local union insisted on purchasing themselves and that is the prize for the babies' race. They would have it no other way. They think that nothing nice enough would be donated to present to the little prize winners. Now, while everywhere around us trouble is brewing and strikes are on, all St. Louis L. U. has to agitate them is the picnic, to try and make it a grand success, socially and financially, and if the bad weather that has just left Chicago does not come down here about that time, we will have the grandest picnic ever given by any L. U. in the Brotherhood.

Yours,

A MEMBER OF NO. 1.

### Another Kick from Baldy.

I am like the old farmer down in Maine; if I have anything to say I must say it or bust, and this is a good chance to keep myself together. My attention has been called to the growing desires of a few restless individuals who seem desirous of running the whole party of working people as they see fit, but that must not be. Many are desirous of becoming leaders in any enterprise, and having failed to reach the goal of their ambition in a noble cause are very apt to change their tactics and try to work evil. Ambition in any worthy undertaking is very commendable, but there is such a thing as being too selfish.

Every man on earth naturally desires to get the very best things, and, of course, must exercise himself to acquire them. Some are so placed that it would be very disastrous (not to them personally, but to their loved ones) were they to act as others wished without turning matters over in their own minds and weighing well the possibilities of the position. Do not always look at one side of the matter only. Associate with your fellow craftsman so that you can gain some idea which will benefit each one materially.

Electrical workers, look to your own laurels. Keep yourselves posted on all the topics of the day. Read the *ELECTRICAL WORKER* for any desired information and if you don't see what you want ask for it. Come to our 4th of July picnic at Ramona Park; have a good time, come early and stay late. Everybody that enjoys our picnic will speak of it after; so help to make it as decorous and enjoyable

as possible. Every member of the Union should lend a helping hand and fill any vacancy that may occur. I am going to be there with my pompadour standing erect and will be found, as always, at your service.

The recent deplorable accidents occurring in such short intervals have had a tendency to make some members of the craft irascible. Don't get disheartened. Consider the matter as a visitation from our Divine Ruler. Our cause is right, and remember the wheels of justice are slow but sure. Our condition is improving every day. Keep a stiff upper although things are not coming as fast as you would like to have them; remember you are not alone; be satisfied with pie two or three times a week, just now, you can soon have sweets three times a day. Remember our mode of living and loving differ in each of us. Some of you have dear ones whose conditions you are trying to better and to whose pleasure you wish to add.

Stick to the Union, boys, and in the end you will find that perseverance in a noble cause will be rewarded.

Again, I say, read the *ELECTRICAL WORKER*, as it has your interests at heart and will “sling ink” in proportion for the good of the N. B. E. W.

Hoping to meet all electrical workers in union I am always Yours to command,

BALDY.

MILWAUKEE, WIS.

June 6, 1893.

*Editor Electrical Worker:*

I must say with my brother members of No. 2 that after reading the last number of the Journal, we were greatly pleased with its contents, and hope every member of the order will take lessons from it and help to enlighten each other in the way that Bro. “Baldy” of St. Louis, writes of in the May issue of the E. W. We know of no better way to enlighten each other than through the columns of our own brotherhood journal. Well, Mr. Editor, business here is fair and all brothers are working.

The Badger Illuminating Co. are putting their overhead wires underground to comply with city ordinances. South Milwaukee is putting in a plant for arc and incandescent lighting, under the supervision of a certain red-headed student of the Western Electric Co. of Chicago. His incompetence is said to have cost considerable money, and to offset this he advises the company to cut down the pay of their workmen.

The Wisconsin Telephone Co. put a cable across the river last week, the largest ever made; 230 pairs of conductors, or 460 single wires in one cable, paper-covered insulation, 600 feet long.

The Electric Railway is rapidly placing their new cars on the street in place of those that were destroyed by fire. They will change their dummy to motor lines this summer. No. 2 will hold her annual picnic at National Park, and sends a cordial invitation to all brothers visiting the World's Fair on that day. No. 2 will take good care of all visiting brothers.

Fraternally,

F. W. SMITH,  
Rec. Sec'y.

NEW YORK.

June 18th, 1893.

*Editor Electrical Worker:*

I take pleasure to inform the subscribers and readers of the E. W. that the electrical workers of New York City, through action taken by Local Union No. 3, will soon have an agreement in force between the Electrical Contractors' Association of New York City and the Brotherhood of Electrical Workers, of such a satisfactory nature, that I predict that within six months, in order to obtain work in this district at our trade one will be compelled to belong to this Brotherhood and be in good standing. Enclosed clippings I take from today's *Sunday News*, the laboring man's paper:



JUN 1893

LABOR NOTES.

The strike of electrical wiremen in the shop of H. Ward Leonard & Co., 136 Liberty street, was declared off yesterday, but no further change in the situation took place. The troubles in the electrical trade are probably on the verge of settlement, as the Board of Walking Delegates expects to sign an agreement soon with the Electrical Contractors' Association.

The manner in which applications are now coming in to No. 3 is very encouraging, and what is to the point, many are those of years of experience in the trade.

Bro. Wm. Ivory, ex-walking delegate of No. 5468 and L. U. No. 3, is now a member of the Executive Board, he having been elected as trustee. His knowledge of organized labor has been of such large experience that he is of invaluable help to that body, and as we have an election of officers soon I would not be surprised to see him elected to his former position, as many are now forced to see how earnestly he worked while delegate.

Permit me through you to heartily indorse the well-chosen article in May issue from the able pen of Brother Hisserich, member of No. 1.

How aptly they do apply to the present aggravated trouble now existing hereabouts.

If not too much trouble to you will kindly convey to Mr. Hisserich of No. 1 my thanks for his timely remarks.

I also wish to thank Bro. Holihan, of No. 43, for the courtesies he extended to me at the funeral of Bro. McDonald. Bro. Holihan and myself were requested to act as pall-bearers with two of his schoolmates, James Smith and Michael Kelly.

I call the attention of our brothers to the fact that our late brother left a family consisting of a wife and three bright little children, the eldest a boy of only 4½ years of age.

LESTER C. HAMLIN,  
Press Sec. L. U. No. 3, N. Y.

542 East 17th street.

NASHVILLE.

June 5, 1893.

Editor Electrical Worker:

No. 5 is slowly but surely increasing its membership and is still in the swim.

An application for a charter has been filed for the Robertson Southern Electric Railway Co., with headquarters at Knoxville. The object is to construct an electric railway from Knoxville to Kingston, Oliver Springs, Poplar Creek coal mines, Clinton, Andersonville, Powell's, Luttrell, Maynardsville, Blaine Cross Roads, Lee's Springs, Strawberry Plains, Daudridge, Alleghany Springs and Little Tennessee River in Monroe County. The company will haul both freight and passengers and eventually construct a cheap system of railways through all East Tennessee. Application has also been made for a charter for the Paint Rock and Tennessee River Electric R. R.

The Electric Light Co. will pay monthly instead of weekly, as heretofore, and the boys will be correspondingly short until the "ghost walks" and Cantrell's Saturday smile will, alas be seen no more.

Bro. Ed. Farwell was elected delegate to the Central Labor Union last meeting, a just recognition of his sterling worth.

Bro. McEwen is on the sick list at this writing, but it is hoped he will soon recover.

Blossom Morrison has been courting the muse again, and the following is the result:

Hush, little baby, don't you cry,  
Papa will buy you a *World's Fair pie*;  
*World's Fair pie* is just immense,  
*World's Fair pie* costs 25 cents.

The only Smith is still inflicting that rabbit story on the unwary. He worked it on a Chinaman last week and the poor celestial has not yet recovered.

Well, as the election of new officers takes place this month, and as there are a number of aspirants for journalistic fame in the union, this may be my

last communication. In the above event may my successor do much better than

Yours fraternally,

P. H. LANGDON,  
Press Sec.

TOLEDO, O.

June 5, 1893.

Toledo takes pride in ranking first as one of the finest and best equipped cities with electricity in the United States. Few cities can equal her rapid transit facilities or has a more perfect system of lighting, all of which has been accomplished within the last three years. Three years ago it had just fifteen miles of narrow gauge railway operated with about as many one-horse bobtails, and her streets were lighted with dim, glimmering gas-jets. But electricity and ingenious financiers has wrought quite a revelation. No more we hear the clinking of the old street-car horse as he sped wearily along, nor see those faint, glim lights which gives a city such a ghastly looking appearance. But instead we have sixty miles of Trolley system operated with two hundred and fifty motor cars of the Westinghouse & Thomson-Houston system, with the very latest improvements.

Her streets are lighted with two thousand arc lamps, and her stores and business places have as many more, and her residences are fast lighting with Westinghouse incandescent system, which is lately being introduced through the Robison Electric Company, in opposition to the General Electric Company, and as opposition is the life of trade, we expect to have before long every residence in the city lighted with electricity.

O. E. McMAHON,  
Press Secretary.

CHICAGO.

CHICAGO, June 15, 1893.

Times are rocky indeed with the brothers in Chicago, but we still think we will pull through. A form of contract was prepared by us and presented in April to the contractors for them to sign.

The terms of the contract were moderate and fair and only adopted by us after the most careful consideration. We asked for a minimum rate for wiremen of 37½ cents an hour, a working day of eight hours and limited the number of helpers that could be employed by any one contractor to two for every five wire-men he hired. After an almost endless amount of persuasive effort, on May 1st, we declared a general strike on all companies, who had not signed. Up to date twenty-eight companies have signed the scale, but four of the largest remain obstinate and we are making a stubborn fight against them. The bottom has dropped clear out of work in Chicago, which, added to the fact that the World's Fair people are turning loose their wiremen on the town, make things, to say the least, embarrassing to the boys. Deter all you can from coming to Chicago expecting to get work.

We wish to express right here the deep sympathy we feel for our brothers in No. 41 in the loss of their President, C. J. Edstrand, not by death, but worse. After accepting the highest office in their power, and having reposed in him the confidence of the brothers even so far as to be made a member of the E. B., he has deliberately allied himself with the people we are trying to make a contract with, and, unmindful of his pledged honor "scabbed" in the rankest manner he could. No. 41, after expelling their unworthy president have elected another brother to fill the balance of the new expected term. We sincerely hope and trust he may prove of the good true metal needed in this critical hour. Everything is not all gloomy for us though, and like most other clouds ours has a silver lining. Unless all indications fail, the first of next month will probably see a good new construction company in the field here that will be union in its principles and in every way disposed to help the boys. Praying now for the good wishes of the many locals in this broad land of ours and for an effort on their part to keep their overflow of

wiremen from coming to Chicago for a little longer, when with work for all we will gladly welcome them, we remain,

Yours in brotherly love,  
LOCAL No. 9, N. B. E. W.

June 8, 1893.

Editor Electrical Worker:

At the regular meeting, May 24, C. J. Edstrands, Seventh Vice-President of the National Brotherhood, and also President of Local No. 41, was present at the request of the trial committee to show reason why he should not be suspended for scabbing during the recent strike.

He was given a fair trial, but as he did not deny the charges preferred, but in fact confirmed said charges, the Trial Board found a true bill and returned a verdict of guilty.

Their verdict was acted upon by the meeting, and Mr. Edstrands was unanimously expelled and dropped from the roll, never to be reinstated again.

Charges were also preferred against Brother Jack Holmes on the same score, as he was with Estrands. Brother Holmes was notified both by letter and word of mouth over a week ago, and as he has not appeared for a hearing at the last two meetings, no doubt the next meeting will take action, whether he is present or not, as his case is an exact parallel of the other.

We had quite an attendance at the meeting last night, and added two "new lights" to the circuit.

I notice an article in the last WORKER from the "Buzzee." In reply to his last sentence, will state that No. 41 is not only supposed to have a Press Secretary, but actually has one, which he would discover should he read THE WORKER more carefully. Although I can not say much for the Press Secretary, I can state that he has not missed an edition as yet.

Work is rapidly progressing at the Fair Grounds, and the illumination "fete" nights is truly a sight worth going a long distance to see.

The South Side before long will be a network of electric railways, as they are turning most of the cross-town lines into electric.

Yours fraternally,  
P. L. ROSS, Press Sec.

INDIANAPOLIS.

June 1st, 1893.

Local No. 10 met as usual at 33½ S. Illinois Street, but owing to the advent of a large circus in town the meeting was slimly attended. Only a few old standbys being present.

Several Terre Hautes are in town working.

Business is dull, considering the time of year, and men are not much in demand, although all that are here seem busy.

Brother Porter has shown up for work, and Brother Charles Neal is reported convalescing.

We have two candidates for the next meeting, and several Terre Haute brothers, with cards, ready to present.

Brush agents from Cleveland are here installing a three machine plant for the Big Four railroad company's new freight depot. Spear and Edwards are the names of the agents.

The machines for the new city plant are not yet set and it will probably be two months before we have light from it.

We have a committee out to present a petition to the City Board of Public Works to appoint a General Wire and Line Inspector for all electrical works in the city, and from reports it will go through o. k.

There is some talk of a St. Louis and Indianapolis Electric Line, but the present terminus in view is Martinsville. If St. Louis' name is mentioned in connection with it any more will let you know.

Our next meeting, Monday, June 5th, at 33½ S. Illinois Street. All visiting brothers are welcome.

Fraternally,  
D. A. GRENEWOOD,  
Press Sec.

## EVANSVILLE, IND.

June 10, 1893.

No. 12 is still coming to the front. Held our regular Tuesday meeting with a very fair attendance, especially for hot weather.

Brother Riggs is recovering from his fall.

Brother Ernst is at Petersburg working on the new plant there.

A letter received from Bro. Edwards says he is very sick at DeWitt, Ark. Brother Edwards left here to accept a position as fireman for the Pine Bluff Light and Power Company. Brother Edwards is well liked here and has the best wishes of No. 12 for his speedy recovery.

Our Union has been discussing the apprenticeship question and we think it would be a good idea for all locals to consider the matter at our next convention at Cleveland and try to embody something in our by-laws in regard to it.

Our president is very strict in adhering to the letter of the by-laws and constitution, though several of the older men and brothers seem to read things in a different light. I would say right here that any young man that can not understand our by-laws and adhere to them is not a very shining light as an electrical worker.

We have a daisy young man in our city by the name of Henry Gawbeck. He was initiated some time ago in the brotherhood with the promise of squaring himself with the boys. The first thing he did was to take out a number of tickets for our dance and sell them and spend the cash. He promised to pay up but he has never done so. He was fined for his conduct and expelled one year from the Union. We were also unfortunate in taking into our Union another rascal of this kind, one Charles Wilkis, by name, a man who loves whiskey better than work. He squandered the money for sixty tickets on whiskey. He is now out of the Union and may possibly take in St. Louis. Watch him if he puts in an appearance.

## CLEVELAND, O.

June 9, 1893.

*Editor Electrical Worker:*

No. 16 is progressing steadily, and we hope in a short time to be able to add a great many members to our number. On May 27 we held an open meeting and entertainment, consisting of a musical programme and a fine speech by our able financial secretary, Bro. Jno. I. Jennings, and from the masterly manner in which he handled his subject, the audience was impressed that the electrical workers have an object, and a very laudable one, too. It was a grand success and all our papers spoke favorably of it. That it has accomplished much good is evident from the number of applications we are receiving, initiating about 10 on our next meeting night, with a good many more in the near future. Shop work at present is getting a little dull, but otherwise all our members are busy, and from the amount of work proposed, this summer will be a busy one in Cleveland. The City Council advertised for bids for about 30 or 40 miles of new railway, and it has been about equally awarded to three companies. One of them will use the storage battery system on about 10 miles, and from latest reports the underground system will be adopted on the others. One franchise was granted for about 15 or 20 miles with the provision that work must be started within 60 days, or the franchise will be forfeited. That is one assurance at least that work will be plenty here this summer. Some of the companies claim their linemen are first class and do not want more than \$2 per day, and companies that are paying more will, in a short time, adopt the same plan, unless something is speedily done to prevent it, and the best means of doing that is what is concerning us most now, and we all hope for a peaceable settlement. Hoping that all locals will be represented in the June issue, I remain, yours, etc.,

NICHOLAS DUFF.

## DETROIT, MICHIGAN.

*Editor Electrical Worker:*

DETROIT, June 13.

Brothers Ryan and Lanahan are working in Chicago.

The Trades Council has indorsed a member of the National Brotherhood of Electrical Workers for the position of City Electrician, and No. 17 unanimously chose Brother John Dyer for the office. He has had sixteen years experience as an electrical worker, is well up in all the details of the business, and would undoubtedly make an able and efficient official.

On the last day of May the machinists employed at the Detroit Electrical Works had a short strike, the first experience these artisans have had in Detroit since their organization. A number of electrical workers also kicked against piece-work. In both cases the demands of the men were granted within a couple of hours.

The public lighting commission are looking around for a suitable location for a power plant. Several sites have been offered them, but either the price or situation has not exactly met with their approval so far. It has been intimated that the "combine" will endeavor to prevent the issuance of the \$600,000 bonds for a public lighting plant, on the grounds that said amount would bring the debt beyond the 2 per cent limit. City Counselor Speed says, however, that the amount would still be within the limit.

For some time past the Detroit Electrical Works has been in financial difficulty, owing largely to a large amount of money being tied up in equipments for street railway plants, which are yielding no returns until a stated time allowed to ascertain the merits and suitableness of the system. The works were indebted to the amount of about \$330,000, and Hugh McMillan holds notes against the concern for \$130,121.07, for money lent. A sale of the concern was advertised for Monday, the 12th inst., and it is probable a reorganization of the works will take place.

The hoodle case against W. H. Fitzgerald, manager of the Detroit Electric Light and Power Company, has been dismissed by Judge Shehan, who considered the unsubstantiated evidence of Alderman Protiva insufficient to convict, as Fitzgerald denied the charge entirely. Now, the \$200 which Protiva claimed to have received as an installment of the \$1000 for his vote and influence, is without an owner. It was handed over to the president of the City Council, and now Fitzgerald says it is not his, while Protiva does not want the vile stuff.

Nelson Crittenden, an employe of the Detroit Electric Light and Power Company, met with his death on one of the company's towers, at an early hour Friday, the 2d inst. He was attempting to clear a ground on the circuit, and, having lost one of his rubber gloves, was working with one bare hand when he received the full force of the current, and must have died instantly upon touching the lamp with the unprotected hand.

Fred Negro was killed the same day by an alternating incandescent current. When found he held the bulb of an incandescent lamp in his hand, the palm of which was said to have been badly burned. This circuit was supposed to have carried only fifty volts.

The press secretary of No. 17 and J. D. Hawkes, Manager of Detroit Citizens' Street Railway, have had a controversy through the press, relative to the iron tie wires holding the feed wires of the electric street railway lines in position on the iron posts. The former maintains that these ties are dangerous where detached telephone wires come in contact with them and then reach the ground. Mr. Hawkes, however, denies the charge, and says that the 500 volts they run will not kill. Since the controversy, one of the company's employes received a sufficient shock from these wires to throw him to the ground (near the Soldiers' Monument), breaking his leg in two places, besides sustaining other injuries. About the same

time a horse was killed through coming in contact with a detached telephone wire, as already pointed out, and the driver found that sufficient current passed through the animal's body and then through the filis of the carriage to shake him up considerably. Still these wires are said to be harmless.

Brother S. K. King has recovered from a three weeks' illness.

The officers of No. 17 will hereafter appear in the meetings wearing resplendent badges of red, white and blue.

At the sale of the Electrical Works, Hugh McMillan purchased the plant for \$100,000. It is said New York and Boston parties will reorganize the works.

REX.

## ATLANTA, GA.

June 5th, 1893.

*Ed. Electrical Worker:*

DEAR SIR AND BRO.—Please allow us space in your columns for the first, but we hope not the last time.

Local No. 22 is quietly moving on. As we have not yet been represented in the ELECTRICAL WORKER, it may have looked as if we were dead, but we are still in the "push," and would make a very lively corpse.

As we are young yet we may be ignorant of many things in regard to the Union, but we will soon learn, and expect to keep on climbing till we reach the highest point of enlightenment.

We organized last March with nine members and have added eleven more lights to our grand circuit and have applicants for eight more, and will initiate them very shortly. I think, very soon, we will have all the electrical workers in the city with us. We have yet to teach some of them what a union is good for and in what manner it will benefit them to become a member. All of us owe Brother Pres. Bullis many thanks for the faithful manner in which he has performed his duties. He has not yet missed a meeting since our organization. He is the right man in the right place.

Five of our members left the city on account of work being dull, but we expect it will pick up shortly and they will return.

One of our brothers, Cal Smith, met with an accident some time ago. He fell from a pole on account of the fixtures giving away. After two weeks of illness he is able to be out and around but is not yet strong enough to work.

Fraternally,  
J. R. WELLBORN.

## LOCAL UNION No. 33.

NEWARK, N. J.

Although not represented in our last number of the ELECTRICAL WORKER, No. 33 is still advancing to the front. And the boys are determined to make this the "Banner" local of this district as we have both the number and kind of material necessary. Local 33 is so well organized now that we have for brothers almost every electrical worker in the vicinity.

At our last meeting several applications were received for membership to the great delight of Brother Whitehouse, who has attained great proficiency as recording secretary and who is just getting his hand in for another term. In going through the regular routine of business, President Leahey never forgets to ask the brothers for their ideas on practical electrical subjects—as a discussion of that kind not only brings out new ideas, but is very interesting and instructing.

One of our most worthy and intellectual brothers has won great admiration for the obvious and facetious way he has of delivering an address or lecture and will not tolerate any interference or interruption until he has concluded his remarks, and thinks that it would be proper to "fine" any brother who may interfere with him before he has taken his seat.



JUN 1893

Brother Beckmeyer, who is one of our delegates to the Trades Council, brings in his report regular and always reports progress in union matters.

There is to be a great time here on Labor-day—one of the special features of the day is to be a grand parade in which all organized labor will take part. The Trade's Council are to award two prizes—one to the organization turning out the largest body of men, and one to the organization turning out the finest looking body of men (we get them both).

In our last month's number of the ELECTRICAL WORKER there appeared a very interesting article under the head of Electrical Education, which should be considered and acted upon as it could not but be a benefit to all electrical workers. In dealing with some of the most simple electrical terms it is often very hard to understand their full meaning, as for instance, we look up the simple word "volt" and find it explained something like this: "Volt" the unit of electrical motive force, one volt will force one ampere of current through one ohm of resistance—"Ampere"—the unit of strength of the current per second, its value is the quantity of fluid which flows per second through one ohm of resistance when impelled by one volt. "Ohm," the unit of resistance through which one ampere of current will flow at a pressure of one volt.

And so we have three of the common every day electrical terms explained in a very clear way, that is to any one who is well educated in all technical electrical terms. But let any one who has not had the necessary education in that line and he would be at a loss to understand their meaning. As all locals are in favor of having some clear and distinct way of enlightening us on such matters it would seem that the "ELECTRICAL WORKER" would be the best thing for that purpose.

Another good thing would be to publish from time to time a list of such books on electrical subjects that we could recommend to the people of our profession.

The New Jersey Telephone Co. have several hundred men at work here making preparations for putting the majority of their wires underground, but as it is being done in such a "hurry up" manner it is pretty certain that there will be more or less trouble continually.

No. 33 expects to give a grand picnic before long and assures all the boys a good time.

Hoping you will give this the necessary space in your paper, I remain,

Fraternally yours,

W. E. ROSSETER.

UTICA, N. Y.

June 4, 1893.

Editor Electrical Worker:

The month of May must have been a hard one upon the nervous system of the whole Brotherhood; so many have had that "tired feeling" in this locality that upon the first meeting night of that month only four out of between twenty-five and thirty showed themselves at our meeting place. But as some of our boys are with the telephone and telegraph companies, they have a most reasonable excuse, viz.: Out of town. Then again, to look at the world outside our city fence, we can point out the publisher, who failed to give us our paper until the 2d of June, and, lastly, and perhaps least excusably, I must admit my own negligence in failing to send my usual letter along.

The month past has not been the most delightful in the memory of our local, as we have had petty kicks from chronic kickers, and one incident has occurred that has not added to our chances of recognition in social circles, and it has made many of us determine that we would stick more closely to that part of our Constitution which calls for sobriety and respectability, and induce—even enforce—other members to do the same; for how can we expect to be recognized by the business and social world when they can point at us as a body and make any drunken comparison? It is a

matter well worthy of every member's cool consideration, and it is to be hoped that all will unite in advancing themselves and, consequently, the Brotherhood in this direction.

I would like to know if any of the other locals about the same size as ours are doing anything in the direction of educative discussions, lectures, etc. We have no good electrical men here who are in touch with us who would make very able lecturers, but we will never say die, and try and start the ball rolling toward the entertainment and edification of our crowd, as I think that this will be necessary in order to keep the dates of meetings green in the boys' memories. We shall look to the pages of THE ELECTRICAL WORKER for papers of the untechnical and practical kind. I am sure that in some of the larger cities there are men who could write very ably on such lines, and hope some of them will prove it by a sample of their ability.

The communication regarding the Cincinnati trouble came to hand a day or two ago, and I must say that there is a great amount of interest centered in that case, and we shall be waiting to hear of the termination of the trouble, and may it be in favor of the boys.

Well, all our boys are working, with but two exceptions, and they are engaged in other pursuits, or they may have got work, as one or two companies have wanted climbers, but there are not enough places here to warrant anyone coming here to look for work; but any member with a clean record can be confident of good usages and a warm welcome.

Well, with earnest wishes for the happy settlement of all difficulties and for the material advancement of the Brotherhood, I remain yours,

HARRY GORDON,

Press Sec.

ROCHESTER, N. Y.

June 8, 1893.

Editor Electrical Worker:

Herewith I hasten to redeem my promise to forward another communication to your valuable paper. It is a great treat to the boys in Rochester to receive THE ELECTRICAL WORKER. After looking all over the other electrical papers, it is a pleasure to drop them and pick up one that gives us the kind of news we want—one that has the welfare of the workmen at heart.

Now, a few words on the strike subject: I have read of them all, and must say I am very sorry to see so many of them. Men should not join a union for the sole purpose of striking, but to elevate themselves and to bind themselves to a body of men whose aim is to better the condition of workmen in our business. Avoid strikes. Strike only when you can not help it. In the last month I have received three appeals for aid from striking members of the Brotherhood.

Allow me to say, in behalf of Union No. 44, we stand ready to lend a helping hand, but all appeals must come through the general office in a business-like manner and then we will act on them.

Men should consider well before striking, for often they have a bitter struggle ahead of them, for a fight against capital is a hard one at the best.

I am sorry to say that some of our craft are willing to strike on the slightest pretext. Now, boys, let us avoid strikes for the present.

I note what Brother Gilbert of Washington had to say in regard to my promise. Allow me to say to him that No. 44 was right in line and will try and hold up her end in future. I read with great interest what he had to say in regard to the Telephone Company, in Washington. I know what he said is only too true. It was my misfortune to work for them eleven years ago, and you bet I was very willing to shake the Capital City and go back among the snowy hills of New York State where men get a better chance.

Am pleased to hear the boys gained a point in Cincinnati, and hope they will win the fight. I

can not see why any superintendent should try to stop a man from bettering his condition, and joining the Brotherhood will do this every time.

It is my sad duty to report the death of one of the oldest linemen in the country, Martin F. Riley, who died at his residence, 394 Plymouth Ave., on June the 4th in his 49th year. "Matt," as he was known to the electrical workers, had been sick over a year, but still his death, though expected, was a bitter blow. He was one of the oldest telegraph men in the business. He worked twenty-eight years for the Western Union Telegraph Company as foreman, and no man was better liked than he. Always just to man and company, generous, kind and true, may he rest in peace, and God in His infinite mercy protect his widow and orphans. His death will be sadly felt by the electrical workers of this section.

The funeral was held this morning from the Immaculate Conception Church at 9. A large number of friends were present. Solemn requiem mass was celebrated by Rev. Father Gleason. The bearers were John Martin, John McGuire, John Foley, John Barnett, John Hall and David Harris. The floral offerings were numerous and beautiful, and included Rock of Ages, pillow, anchor, wreaths, star and crescent, gates ajar, harp, cross, and cut flowers in profusion.

His funeral was largely attended by electrical workers from Rochester, Syracuse and Buffalo.

Wishing all the boys in the Brotherhood success, I am, fraternally yours,

H. W. SHERMAN.

EAU CLAIRE, WIS.

Judge Bailly has appointed Ralph E. Rust receiver of all the property of every kind and character of the National Electric Manufacturing Company. It is expected that under the receivership the business will be conducted in all the departments until a reorganization is effected.

The assets of the company appeared to be about \$560,000 and its indebtedness about \$460,000. It has on hand a large number of orders and is constantly receiving orders for its machinery, and it appears that the apparatus made by it is entirely satisfactory to the public. Owing to the stringency of the times it was unable to collect the debts owing to it, and unable to secure extensions of its paper, and whereas persons having claims against it were insisting upon immediate payment and refusing extensions and for several days last past several thousand dollars of its notes have been protested for non-payment. Suits were threatened for the collection of these claims and it was deemed best to place the entire property in the hands of a receiver.

The company has a large plant and a large amount of material on hand and it is entirely unincumbered.

The Atlantic Hotel, corner Van Buren and Sherman streets, Chicago, is quite a headquarters for visiting members of the N. B. E. W. The handsome manner in which the Cummings Brothers, proprietors of the new hostelry, entertained the delegates to our convention last fall made them many friends, and their liberal treatment of guests is in strong contrast to the exorbitant demands made by most hotels and boarding houses of the Windy City. If visiting the World's Fair, be sure and call, and you will meet many of the brethren.

You

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Gen'l Pass. and Tkt. Agt.,  
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DIRECTORY OF LOCAL UNIONS.



(Secretaries will please furnish the necessary information to make this directory complete. Note that the time and place of meeting, the name of the President, the names and address of the Recording and Financial Secretary are required.)

**No. 1, St. Louis, Mo.**—Meets every Tuesday evening at 305½ Olive st. D. Lafferty, President; M. L. Purkey, Recording Secretary, 207½ N. Twelfth st.; John Hisserick, Financial Secretary, 315 Chestnut st.

**No. 2, Milwaukee, Wis.**—Meets 1st and 3d Wednesday at 526 Chestnut st. W. Denning, President; F. W. Smith, Recording Secretary, 377 Fifth st.; E. Talbott, Financial Secretary, 315 Jackson street.

**No. 3, New York, N. Y.**—Meets every Thursday evening at Clarendon Hall, 114 E. Thirtieth st. Second and fourth Thursdays are devoted to lectures and instructions on practical electrical subjects. John P. McMahon, Pres.; Lester C. Hamlin, R. S., 542 East 17th st.; E. D. Leaycraft, F. S., 283 Flatbush ave., Brooklyn.

**No. 4, New Orleans, La.**—Meets 1st and 3d Wednesday at Odd Fellows' Hall. Wm. Moake, President; J. C. Bradley, Recording Secretary, Napoleon and Custom House sts.; J. J. Vives, Fin. Sec., 173 S. Basin st.

**No. 5, Nashville, Tenn.**—A. H. Praugue, President; J. C. Bender, Recording Secretary, 817 N. Market st.; E. W. Morrison, Financial Secretary, 308 N. Summer st.

**No. 6, Memphis, Tenn.**—E. J. Gray, Secretary, 20 Goslee st.

**No. 7, Springfield, Mass.**—John Hoyt, President, F. Wyatt, Recording Secretary, Hotel Glenham; S. F. Cameron, Financial Secretary, 267 Main st.

**No. 8, Toledo, O.**—Meets every Thursday at 223 Summit st. James Carney, President; Michael Connors, Recording Secretary, 213 Everett st.; T. H. Nevitt, Financial Secretary, 1007 Bartlett st.

**No. 9, Chicago, Ill.**—Meets every Saturday at 199 E. Randolph st. G. W. Edison, President, Gus Sauers, Recording Secretary; J. H. Capps, Financial Secretary, 199 E. Randolph st.

**No. 10, Indianapolis, Ind.**—Meets every other Monday at 33½ S. Illinois st. Sam'l B. French, President; L. E. Jones, Recording Secretary, 95 N. Meridian st.; C. W. Neal, Financial Secretary, 199 W. Maryland st.

**No. 11, Terre Haute, Ind.**—Meets every 2nd and 4th Tuesday at Washington Hall, cor. Eighth and Main sts. John Davis, President; Harry Bledsoe, Recording Secretary; Wm. C. Bledsoe, Financial Secretary, 424 S. Thirteenth st.

**No. 12, Evansville, Ind.**—Meets every Tuesday at Tenney Hall, Main st. R. Wright, President; Harry Fisher, Recording Secretary, 202 Clark st.; L. E. Wilke, Financial Secretary, box 266.

**No. 13, Cincinnati, O.**—Meets every Monday at Germania Hall, Vine st. J. C. Williams, President; J. B. Walker, Recording Secretary, 131 W. Ninth st.; H. D. W. Glenn, Financial Secretary, 27 Elizabeth st.

**No. 14, Bridgeport, Conn.**—C. F. Callahan, President, 173 Fairfield ave.; Ed Fagan, Jr., Recording Secretary, 78 Gregory st.; W. O. Kellogg, Financial Secretary, 160 Cannon ave.

**No. 15, Worcester, Mass.**—Chas. Cumming, Recording Secretary, 393 Main st.

**No. 16, Cleveland, O.**—Meets every Saturday at 94 Superior st. J. J. McGovern, President; N. Duff, Recording Secretary, 44 Wilson place; J. J. Jennings, Financial Secretary, 252 Washington st.

**No. 17, Detroit, Mich.**—Meets 1st and 3d Thursday at Trades' Council Hall, 224 Randolph st. W. C. Shuart, President; I. B. Miller, Recording Secretary, 71 Henry st.; E. J. Lane, Financial Secretary, 705 15th st.

**No. 18, Kansas City, Mo.**—Meets every Friday evening at Industrial Hall, cor. Eleventh and Main sts. J. J. Jones, President; C. H. Adams, Recording Secretary, 215 W. Fourteenth st.; J. C. Tanpert, Financial Secretary, M. & K. Tele. Co., Sixth and Delaware sts.

**No. 19, Pittsburg, Pa.**—W. J. Condon, President, 4 Mansion st.; C. C. Logan, Recording Secretary, 210 Emerson st.; C. Murphy, Financial Secretary, 167 Second ave.

**No. 20, New Haven, Conn.**—S. R. Morrison, President; D. C. Wilson, 157 St. John st. Recording Secretary; J. Carter, Financial Secretary, 270 Hamilton st.

**No. 21, Wheeling, W. Va.**—C. L. Ullery, President, J. F. Bonnett, Recording Secretary, 2623 Jacob st. Wm. C. Prickett, Financial Secretary, box 111.

**No. 22, Omaha, Neb.**—Meets at Arcanum, Hall, 1314 Douglas st. J. J. Dooley, President, 1405 Jackson st.

**No. 23, St. Paul, Minn.**—Joe Macauley, President; Thos. Carey, Recording Secretary, 311 E. Thirteenth st. F. A. Zimmerman, 66 Douglass st., Financial Secretary.

**No. 24, Minneapolis, Minn.**—P. J. Fleming, President; W. Allen, 822 Eighth ave., S., Recording Secretary; Geo. Hulig, Financial Secretary, 25 Seventh st., south.

**No. 25, Duluth, Minn.**—S. J. Kennedy, President; Phil. Bellivere, Recording Secretary, Wieland Bk.; C. C. Miles, 28 Seventh ave., west, Financial Secretary.

**No. 26, Washington, D. C.**—Meets every Friday evening at K. of P. Hall, 425 Twelfth st. Nw.; R. F. Metzger, President; W. W. Gilbert, Recording Secretary, 941 Maryland ave. Sw.; P. A. Deffer, Financial Secretary, 941 Maryland ave. Sw.

**No. 27, Baltimore, Md.**—Meets ———. Fred Russell, President, 1408 Asquith st.; Wm. Manning, Recording Secretary, 1026 N. Front st.; J. W. Ebaugh, Financial Secretary, 107 N. Gay st.

**No. 28, Philadelphia, Pa.**—Meets ———. J. W. Fitzpatrick, President; H. B. Frazer, Recording Secretary, 1425 Vine st.; Thos. Flynn, Financial Secretary, 1116 Jackson st.

**No. 29, Atlanta, Ga.**—H. C. Bullis, President; J. R. Wellbern, Recording Secretary, 57 Butler st.

**No. 30, Trenton, N. J.**—S. L. Runkle, President, Trenton Electric Light and Power Co.; Ed. Anderson, Recording Secretary, Trenton Electric Light and Power Co.; Joe Harris, Financial Secretary, Trenton Electric Light and Power Co.

**No. 31, Jersey City, N. J.**—Thos. Watson, President; A. Richmond, Recording Secretary, 212 Wayne st.; John Speicher, Financial Secretary, 105 Newark ave.

**No. 32, Paterson, N. J.**—John Kane, President; Frank Areson, Recording Secretary, 214 Godwin st.; J. W. Estler, Financial Secretary, 118 E. Thirty-Third st.

**No. 33, Newark, N. J.**—Meets every Monday evening at No. 58 Williams st.; Thos. Leahey, President; J. S. Stiff, Financial Secretary, 38 Elm st.; W. Whitehouse, Recording Secretary, 117 Quitman st.

**No. 34, Brooklyn, N. Y.**—T. J. Holihan, President; T. L. White, Recording Secretary, 363 Cumberland st.; P. J. Dnnn, Financial Secretary, 219 Adams st.

**No. 35, Boston, Mass.**—Meets 1st, 2d and 3d Wednesday and last Sunday, p. m., of each month. Ira M. Mosher, President; John H. Mahoney, Recording Secretary, No. 69 Essex st.; P. H. Dacey, Financial Secretary, 17 Hanson st.

**No. 36, New York, N. Y.**—Meets weekly at Ledwith Hall, Forty-fifth st. and Third av.; J. E. McGinty, President; L. L. Hall, Recording Secretary, 117 Leonard st.; John J. McDounell, Financial Secretary, 1632 Madison ave.

**No. 37, Hartford, Conn.**—Meets 1st and last Friday of each month at Central Union Labor Hall, 11 Central Row. Morris Cavanagh, President; J. T. Neville, 289 Allyn st., Recording Secretary; Geo. Dugan, Financial Secretary, 27 Affleck st.

**No. 38, Albany, N. Y.**—Meets the 1st and 3rd Thursday of each month. M. J. Cellery, President; John M. Wiltse, Recording Secretary, 22 Third st., E. Albany; Owen Dooney, Financial Secretary, 4 Rensselaer st., Troy.

**No. 39, Grand Rapids, Mich.**—J. R. Watson, President; L. L. Henry, Recording Secretary, 97 Ottawa st.; Geo. Dierdorf, Financial Secretary, 723 Fifth ave.

**No. 40, St. Joseph, Mo.**—Meets every Saturday at Weidmeier & Wildburger's Hall, 623 Messanie st.; M. L. Durkin, President; M. S. Keraus, Recording Secretary, St. Joseph Electric Supply Co.; R. W. Stockwell, Financial Secretary, M. & K. Tel. Co.

**No. 41, Chicago, Ill.**—Meets every Wednesday at 116 Fifth ave. Chas. Osberg, Recording Secretary, 234 Townsend st.; Wm. Meacham, Financial Secretary, Crawford, Cook Co.

**No. 42, Utica, N. Y.**—Meets 2d and 4th Thursday at Trades' Hall, Bleeker st. W. B. McCoy, President; E. F. Allen, Recording Secretary, Columbia and Camelia st.; Harry Gordon, Financial Secretary, 512 Whiteboro st.

**No. 43, Syracuse, N. Y.**—Jas. Tyrell, President; A. D. Donovan, Recording Secretary, 305 Temple st.; Chas. Beattie, Financial Secretary, 217 N. Crouse ave.

**No. 44, Rochester, N. Y.**—W. Carroll, President; H. W. Sherman, Ninth and Rowe, Recording Secretary, J. Desmond, Western and North ave., Financial Secretary.

**No. 45, Buffalo, N. Y.**—E. Calvin, President; F. Hopkins, Recording Secretary, 77 Swan st.; H. L. Mack, Financial Secretary, 14 Mason st.

**No. 46, Reading, Pa.**—Lucian Bowman, President; Harry Weidner, Recording Secretary, 225 Pearl st.; Jacob F. Winebrake, Financial Secretary, 312 N. Ninth st.

**No. 48 Sedalia, Mo.**—Meets every Thursday at Second and Ohio sts.; C. E. Jackson, President; Ed. McCoy, Financial Secretary; L. L. Brewington, Recording Secretary.

**No. 49, Bloomington, Ill.**—C. F. Snyder, Recording Secretary, 405 N. Main st.

**No. 50, Birmingham, Ala.**—M. V. Moore, President, 620 Eighteenth st., South side.

**No. 51, Scranton, Pa.**—John J. Laughlin, President; John B. Reilly, Recording Secretary, 525 Pleasant st.

TAKE NOTICE.

Officers of Local Unions should carefully read the following rules before writing for information:

1. Give notice at once when a change occurs in Secretary's address, or when a vacancy has been filled by the election of a new officer.
2. Consult the financial report in the WORKER every month, and if incorrect, report at once.
3. Arrange to receive any mail that may be en route to old addresses of officers, when change occurs.
4. In reporting the election of new officers, use the regular blank furnished for that purpose, and write plainly the name and address of each officer.
5. The monthly report of the financial secretary must accompany the dues sent.
6. Never fill out a report of any kind until first making it out on waste paper, then copy it on the regular report blank. This obviates alterations and scratching.
7. Always put name and address on reports and letters.
8. Send in name, number of card, age, and date of admission of each new member, as he will not be entitled to benefits until his name is enrolled on the books at the general office.
9. Report promptly the suspension or expulsion of members; also traveling cards taken out.
10. When sending money always state what the amount is for; do not leave it for the G. S.-T. to guess at.
11. All orders for supplies should be accompanied with the requisite amount of money.
12. Never send money in a letter. All remittances should be forwarded by post office money order, express money order or bank draft.
13. Unions indebted for over two months' dues are non-beneficial (see Art. XV. Sec. 5). All members are interested in this matter and should look after it closely.
14. On the expiration of a traveling card the member holding said card should pay one month's dues and receive a due card and be enrolled as a member of the Union, the same as a new member.



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15. All Local Treasurers should be under bond and the same filed with the G. S.-T.
16. All receipts and correspondence from the general office should be read at the meetings.
17. Read the constitution carefully and consult it on all matters that arise for consideration.
18. Make out all reports with ink and use the regular report blanks and letter paper furnished for that purpose.
19. When admitting or reinstating members the strictest inquiry as to health must be observed. If the member is married the wife's health must also be noted.
20. Claims for benefit must be filled out in every particular, and the law in regard to their presentation rigidly complied with.
21. No claims will be allowed unless the member is square on the books. Our beneficial system would cease to be an incentive for prompt payment of dues were this law not enforced.
22. Remittances of dues is not allowed under our Constitution. The amount of the dues must be deducted from the sick benefit paid by the Local. A member entitled to benefits can not get in arrears while receiving benefits. Members, by contribution, can keep the dues of a sick or unfortunate brother, not entitled to benefits, paid up.
23. Salaried officers must pay their dues and carry due cards. When salaries are due they must present their bill, and its payment passed on the same as any other bill presented to the Union.
24. Newly-elected officers must procure all blanks, documents, etc., from their predecessors.
25. Unions shall never assume to pay the funeral expenses of deceased members until first assured that the claim is allowable.
26. Preserve old due cards. They may be useful for reference in case of dispute over dues, etc.
27. Members should always when attending meetings of the Union have with them their Constitution and By-Laws; also their due cards.
28. Parties making statements in reference to recreant members will be held responsible for statements sent in for publication.
29. Matter for the ELECTRICAL WORKER must reach the general office by the 10th of each month.

As we are about to open a new roll book we request all Secretaries to furnish us as soon as possible a complete roll of their members since their Union was organized. Some of the Unions with a membership of 100 to 200, according to the Financial Secretary's report, have less than twenty entered on the books at the general office, and none outside of those twenty would be entitled to death benefits.

Send in the name of every member initiated since the Union was organized, even though long since suspended or expelled. This is necessary, as we must have correct record of every member who ever belonged to the Brotherhood.

#### Electric Light in Surgery.

By the latest application of electricity to the medical science it has become possible to utilize the human head as a lantern. This was proved by Dr. Wendell C. Phillips at a recent meeting of the laryngological section of the Academy of Medicine.

The electrical apparatus used is called a "head illuminator." It consists of a small incandescent globe and an electric light of three candle-power and about as big as a grape. It is adjusted to the end of a rubber tube, which, in appearance, resembles a lead pencil, and through which the wires reach the globe.

In demonstrating the properties of this light before the Academy of Medicine, Dr. Phillips called a small boy to the platform and placed the instrument in his mouth. The boy closed his lips, all the lights were turned out, and then the light in the instrument was turned on.

Immediately the boy's cheeks became translucent and every vein and imperfection of the skin stood out with distinctness. The light also shone through the upper part of the face.

"The beauty of the illuminator," said Dr. Phillips, "lies in the fact that it enables us to read certain conditions of the head which could only be learned heretofore by operations or probings. If the light shines through one side of the face and not the other, we know the dark side is affected."

"It also throws a light through the bones of the face and discloses formations of the bone, which, under other circumstances, could only be ascertained by drilling into the bones."

"Placed in the corner of the eye, the light shines up through the cavity in the frontal bone just over the eyebrow. Catarrhal diseases are thus located."

Here the doctor placed a small section of a rubber hose over the light which he held in his hand at the time.

"Now notice how this shines through my thumb," he continued. "Well, if there was a splinter there it could be accurately located. Any disarrangement of the small bones of the hand could be ascertained in the same manner."

"This light," said the physician, "shines into and down the throat of a patient who is being examined for throat troubles. This latter examination can also be performed by the insertion of a small electric light the size of a pea."

There is another instrument consisting of a flexible tube with a small lamp at the end and connected with a battery. The patient swallows this lamp, and when it reaches the stomach it shines through, so diseased organism can be plainly read from the outside. The circulation is visible and an abnormal development stands out like a mole on a person's neck.

"All these instruments and devices," added Dr. Phillips in conclusion, "are the results of study made by prominent physicians and surgeons. I have not invented these things. I have only developed them. We haven't reached the highest development of the use of electricity in the medical science yet. We are working now on new lines."

—N. Y. Herald.

#### Electrolysis of Water Pipes.

C. H. Morse, Inspector of Wires at Cambridge, Mass., in a paper read before the New England Water Works Association, speaks as follows about his investigations on the action of electricity on water pipes:

When the [Cambridge] railroad company put in their power plant, they ran large numbers of feeders, as we call them, and one wire between the rails, and attached the two rails to this return wire so that the current would go to the car through the motor wheels, to the rails, and get along as best it could to the station. This became very soon an uncertain path, as it was found that electrolytic action took place upon this wire and it disappeared in places. They thought at first that it was due to something in the soil, but it was very soon traced to the same enemy which you have to contend with, that is electrolytic action. I remember the practical experience we had with these dead rails, as we call them. When this wire was eaten off and a car came on to that section, if by chance you placed one foot upon the rail and another upon the ground near it, shocks could be obtained. That happened simply in this way: The current must go back to the station, and it would take to the rail, which was not well grounded, would go up one leg of a man who stood on the rail and down the other to the earth, especially if the earth was a little moist. The effect was so great that the West End Railroad Company made a complete change and reversed the conditions. . . . That is, they attached the other pole to the earth to remedy this difficulty, and instead of sending the current out over the feeders, they commenced to force it out through the ground, have it go up through the cars and back through the feeders.

Mr. Nevons and I went to the different places where we had traced these difficulties, and found that lead pipes had disappeared in a short space of time, some even in six or eight weeks. Iron pipes had been tried with the same result, also galvanized iron; brass pipe had been put in and deterioration was noticed at once. Rustless iron was tried and it did rust decidedly. Well, it was not the work of any mysterious agent, but was the result of what almost all of you have seen in school experiments; that is, the decomposition of water. The current left the West End power-house at East Cambridge, it flowed through the ground, and, of course, divided according to the resistance, and took to whatever conductor came in its way. It took to the rails, the water pipes and gas pipes. Now we get no action except at what we call the positive pole. That is where the current is flowing out of the pipes; where it takes to the pipe there is no action. The current flowed along on the pipes and in this particular case it got down onto Bridge street, which is near Charles River, and flowed along our supply pipes on the wharves, and here it had to get across the river to propel the cars in Boston. Where it left those pipes action took place.

Mr. Morse goes on to state that the loss from this leakage was not confined to the destruction of pipes, but that the electric company sustained heavy loss of power, amounting to from 25 to 45 volts out of a maximum pressure of 500 volts. He estimated the loss of power in another instance at about 20 per cent.

The effect of reversing the current led to a new difficulty. "We then hurt one of our old friends seriously—that is, the gas company," says Mr. Morse. "The current will flow on the water pipes, and it has an easy chance to leave them through their connection with the negative pole of the dynamo. Now it flows along on the gas pipe, and as soon as it can it will leave the gas pipe to take to the water pipe." Then, of course, it sets up electrolytic action in the gas pipes. The essayist asks: "How are we to remedy the difficulty?" and answers: "I know of no way by which we can use the single trolley wire system and overcome this difficulty without putting up an immense amount of overhead returns, through which the resistance will be reduced to almost nothing."

#### Electric Traction for Railways.

According to a German engineer, electric traction has a most encouraging future. He asserts that a high tension dynamo machine has a higher efficiency than the locomotive, even admitting a loss from ten to seventeen per cent in transmission, and that electric traction is more suitable for hauling trains at high speed over grades, expending one-half less energy than by locomotive traction. He estimates that a stationary engine uses but  $1\frac{1}{2}$  lbs. of coal per horse-power per hour against about  $3\frac{1}{4}$  lbs. consumed by a locomotive. These figures, although of correct ratio, seem very low. The author goes on to show that, for hauling ordinary and express trains at a speed of 32 to 50 miles per hour, electric traction uses but 60 per cent of the energy used by the locomotive, and that the profit gained from electric traction—taking for an example a 60 ton train running at 50 miles per hour—the locomotive must develop 548 horse-power, while electric traction needs but 280 horse-power, say a saving of 49 per cent. Taking into account interest upon the capital engaged, depreciation, etc., also considering the increase in the number of trains and higher speed, the gain obtained over the present system is estimated at 70 per cent.

#### Improved Theatrical Lightning.

M. Trouve, the French electrician, has been turning his attention to the production of new storm effects in theatres. The old plan of making theatrical lightning was to flash lycopodium powder behind a zigzag line cut in the scenery. M. Trouve's new method consists in moving a long bamboo rod up and down in a zigzag direction and flashing a small electric incandescent lamp attached to the end of the rod. The flashing is done by starting and stopping the current with a commutator controlled by the foot. Very effective lightning is also made by rubbing together an old file and a piece of carbon which are attached to the end of wires connected to the lighting circuit. The sound of the wind in a storm is imitated by means of a double-action pump and two sirens, and that of hail by throwing coarse sand against a screen of osiers.

#### The Electro-Deposition of Metals on Glass.

The combination of metal and glass in various departments of useful and ornamental work is now being so largely adopted that a new method of depositing metals upon glass, porcelain, etc., will have a sphere of usefulness, all the more extended because of the extreme simplicity of the process. A paste of finely divided silver, plumbic borate and oil is first applied to the article to be decorated, which is then removed to a muffle furnace and subjected to a moderate degree of heat. This gives a film of strong adhesiveness, which possesses high conductivity, and upon which a firm and satisfactory coating can be readily deposited by the ordinary electrolytic methods.

#### Electricity in the Household.

It is doubtful if so thorough and at the same time so practical a test of the feasibility of using electricity for various household requirements has ever been made anywhere as that instituted by a gentleman of Brooklyn, who is utilizing the subtle current for all of his heating, lighting and cooking needs, with the result that coal and gas have been entirely dispensed with in his family. Housewives will be particularly impressed with the statement that even the exigencies of wash day are fully met by the new agent, the water being boiled by electrically generated heat, and even the flatirons being kept hot by an electric heater stored within them, which has the advantage of maintaining an invariable temperature.

LULLED in the countless chambers of the brain, our thoughts are linked by many an endless chain: awake but one, and lo, what myriads rise.—[Pope.]

## GENERAL NEWS.

## Where Electrical Workers May Look for Work.

**GALENA, ILL.**—The Galena Electric Light Company will transfer its plant to Baraboo, Wis. Failure to get the contract for lighting caused the stop.

**GRAND RAPIDS, MICH.**—A street railway ordinance has been passed for the extension of the street railway on several streets.

**UHRICHSVILLE, O.**—The Council of Uhrichsville has accepted the bid of C. E. Mitchner for building and operating the electric road to be built from New Philadelphia to Uhrichsville. Work will begin at once. This road will connect Canal Dover, New Philadelphia, Midvale, Uhrichsville to Dennison, and will in the near future go through this place to New Comerstown.

**GREENSBURG, PA.**—The Pittsburg, Greensburg & Latrobe Electric Railway Company has been incorporated with a capital stock of \$1,000,000 to build an electric road between the cities named.

**DETROIT, MICH.**—The Council special committee on streets and ordinances have decided to recommend that the firm of Parke, Davis & Co. be given a general electric lighting franchise for twelve years, covering the entire city. The committee proposes to charge the firm \$5 a mile for every mile of wire each year, and \$1 a year for every pole. The firm is prohibited from selling to other companies or combining with other companies on rates of service.

**EAU CLAIRE, WIS.**—The Council granted a franchise to the Eau Claire Telephone & Lighting Company to light the city for five years, at \$75 per arc lamp and \$7 per incandescent.

**BRADFORD, PA.**—The plant of the Electric Light & Power Company will be increased by the addition of a 200 horse-power engine, a 2,000 incandescent light machine, and a 50 arc light machine.

**WEST CHESTER, PA.**—J. M. Patterson of Millington, Pa., is here, and states that the proposed electric road from Lancaster to Philadelphia will surely be built, and that two-thirds of the right-of-way has been secured.

**EASTON, PA.**—The Easton & Bangor Street Railway Company has been incorporated with a capital stock of \$1,000,000, to build a 16-mile road between these points.

**CLEVELAND, O.**—The General Electric Light Company will erect a three-story 165x90 feet power house on Canal Street. Cost, \$60,000.

**DETROIT, MICH.**—The Detroit Electrical works plant was sold on a foreclosure suit for \$1,000,000. W. H. Wells bid that amount for Hugh McMillan, and that was the only offer made.

**KINGSTON, N. Y.**—The Colonial City Electric Railway Company was incorporated with a capital stock of \$175,000, to build a surface street railway here to be six miles in length.

**KNOXVILLE, TENN.**—The Robertson Southern Electric Railway Company has been incorporated here to build an electric road from here to Sevierville, Kingston and Allegheny Springs and the Little Tennessee River in Monroe County. The company will haul both passengers and freight.

**NEW ORLEANS, LA.**—Directors of St. Charles Street Railway Company will consider an issue of \$1,000,000 bonds for electrical equipment, at a meeting to be held June 10th. Alden McLellan, president.

Hillsdale's new electric plant is not to exceed \$15,000. It is to be paid for in seven years.

Joliet is to have a new electric light plant. J. A. Henry, the street car man, and Mr. Moran are the proprietors.

**ANTHONY, KAS.**—The electric light company of Anthony commenced the work of putting in poles, last week.

**OBERLIN, O.**—Oberlin has contracted for thirty-nine arc lights, at \$50 per light. Some street paving will also be done.

**MILWAUKEE, WIS.**—The Electric Light and Power Company is erecting its poles for wires. There will be 244 poles, 100 feet apart, among the principal streets.

**MIDDLETOWN, O.**—A movement is on foot to put electric boats on Miami and Erie Canals. They may run between Toledo and Cincinnati.

New Kensington will very shortly have a telephone exchange central. The poles for the wires have been placed in position as far east as Saltsburg, where the line will terminate.

**JEFFERSON, WIS.**—Work on the electric light plant is being pushed with energy. The foundation has been laid for a building, to cost in the neighborhood of \$4,000.

**WATERTOWN, WIS.**—During a storm at Watertown lightning struck the electric light plant, demolishing the incandescent light dynamo, thus preventing the lighting of buildings. The loss will amount to \$500.

**PITTSBURG.**—The American Bell Telephone Company has scored the first victory in its fight against competitors. In the United States Circuit Court Judge Acheson handed down an opinion granting a preliminary injunction against the McKeesport Telephone Company and others.

**SEDALIA, MO.**—It is learned that the Missouri, Kansas and Texas Railroad Company will at an early date commence the construction of a telephone line from St. Louis to Parsons, Kans., a distance of 348 miles. The wire will be strung along the telegraph poles from St. Louis to Boonville and from Boonville to Parsons.

**SAN ANTONIO, CAL.**—There is in operation here an electric light plant that transmits 10,000 volts over twenty-eight miles of wire. This would tend to show that the machines for transmitting power a long distance are thoroughly practicable. In Redlands there will be finished before three months are over a plant transmitting 3000 horse-power over twenty miles.

A rushville woman who sued the electric lighting company there because the operation of its machinery interfered with the repose of the guests of her hotel and hence with profits of her business, was awarded damages in the Circuit Court. She was given a verdict for \$300.

An inquiry directed to twenty-nine small cities from Maine to Texas, having their electric street lamps provided and maintained by corporations, shows that the average annual cost per lamp to the cities is \$106.01. A similar inquiry directed to twenty-three small cities that own and rule their own electric street lamps shows that the average annual cost per lamp to those cities is \$63.04. In the latter case several of the cities obtain considerable income from lamps supplied to private persons.—*Ex.*

A man who was bathing was seized with cramp and sank, being two minutes below water. For some time after he was rescued life was thought to be extinct. An electrical current was passed between the nape of the neck and the heart. Within a very short time animation was restored, and the man recovered.

**SWAN,** the English electrician, declares that he has recently seen an electrical blow-pipe capable of melting iron so rapidly that it would require but a few moments to destroy the strongest fire and burglar-proof safe. To use this blow-pipe a forty-horse-power dynamo is needed, which could not conveniently be added to the ordinary kit of burglars' tools.

The Central Telegraph exchange of France, is simply a bureau of transmission, and neither directly receives nor distributes dispatches. It transmits 36,250 telegrams daily, and furnishes employment to 500 men and 400 women.

## ELECTRICAL PATENTS.

The following recent electrical patents are reported by Higdon & Higdon & Longan, patent lawyers, 215, 216 and 217, Odd Fellows' Building, St. Louis, and 48 Pacific Building, Washington, D. C.:

- 497,504, Armature core for electric motors, James E. Stuart and U. S. James, Helena, Mont.
- 497,361, Commutator brush holder for dynamo electric machines, Elihu Thomson, Swampcott, Mass., assignor to Thomson-Houston Electric Company of Connecticut.
- 497,680, Cut-out apparatus for net works of multiple-electrical conductors, Paul Nordman, assignor to Siemens and Halske, Berlin, Germany.
- 497,491, Automatic cut-out for electric light circuits, Charles Cuno, Wauwatosa, Wis.
- 497,535, Manufacturing electric conduit sections, James F. Cummings, Detroit, Mich.
- 497,482, Shunt for electric light and power stations, Edward Weston, Newark, N. J.

- 497,468, Dynamo-electric machine and motor, Walter H. Freeman, Boston, Mass.
- 497,536, Underground conduit for electrical conductors, James F. Cummings, Detroit, Mich.
- 497,755, System of electrical distribution, Walde-mar K. Meissner, Konigsberg, assignor to Siemens and Hakskek, Berlin Germany.
- 497,522, System of conductors for electric fire engines, Joseph Sachs, New York, N. Y.
- 497,54, Device for illuminating gun sights by electricity, Giovanni G. Di Giovanni, Turin, Italy.
- 497,438, Arc electric lamps, John C. Wray, Peoria, Ill.
- 497,494, Electric arc lamp, James Einstein, Munich, Germany, assignor to P. Lemaire, New York, N. Y.
- 497,358, Electric arc lamp, Frank H. Thompson, Philadelphia, Pa.
- 497,394, Conduit electric railway, George Westinghouse, Jr., Pittsburgh, Pa.
- 497,337, Overhead electric railway, Wm. D. Patterson, Keokuk, Iowa.
- 497,408, Electric railway signal, Wm. H. Jordan, Brooklyn, N. Y.
- 497,377, Conduit railway trolley, Paul C. Just, Chicago, Ill.
- 497,585, Closed conduit for electric railways, Archibald J. Martin, Philadelphia, Pa.
- 497,436, Sectional contact conductor for electric railways, George Westinghouse, Jr., Pittsburgh, Pa.
- 497,495, Electric rink, Midbury W. Hassan, Rochester, N. Y.
- 497,887, Armatures for electric motors or generators, James F. McLaughlin, Philadelphia, Pa.
- 497,790, Electric broiler, Samuel B. Jenkins, assignor to American Electric Heating Company, Boston, Mass.
- 497,791, Electric radiator, Samuel B. Jenkins, assignor to American Electric Heating Company, Boston, Mass.
- 497,792, Electric flat-iron heater, Samuel B. Jenkins, assignor to American Electric Heating Co., Boston, Mass.
- 497,793, Electric soldering iron, Samuel B. Jenkins, assignor to American Electric Heating Company, Boston, Mass.
- 497,794, Electric heater for flat irons or other articles, Samuel B. Jenkins, assignor to American Electric Heating Company, Boston, Mass.
- 497,795, Electric heater, Samuel B. Jenkins, assignor to American Electric Heating Company, Boston, Mass.
- 498,153, Thermal circuit closer and indicator, Jay L. Bradley, St. Louis, Mo.
- 497,869, Electric accumulator, Paul J. R. Dujardin, Paris, France.
- 497,838, Safety appliance for systems of electric distribution, E. Thomson, Lynn, Mass., assignor to Thomson-Houston Electric Company of Connecticut.
- 498,766, Clamp for electric conductors, A. H. England, Chicago, Ill.
- 498,878, Electric illumination apparatus, A. E. Colby, Newark, N. J.
- 499,014, Dynamo electric machine, W. F. S. Dillon, Chicago, Ill.
- 498,988, Electric signal and protective, C. E. Ongly, New York, N. Y.
- 498,880, J. Des Brisay, electric switch, New York, N. Y.
- 499,183, Friction clutch for electric motors, O. Dahl, Patterson, N. J.
- 499,596, Electric igniting device, W. H. Russell and G. E., Jersey City, N. J.
- 499,473, Electric light, G. Sautter, Paris, France.
- 499,543, Electro-magnetic car brake, J. C. Henry, Westfield, N. J.

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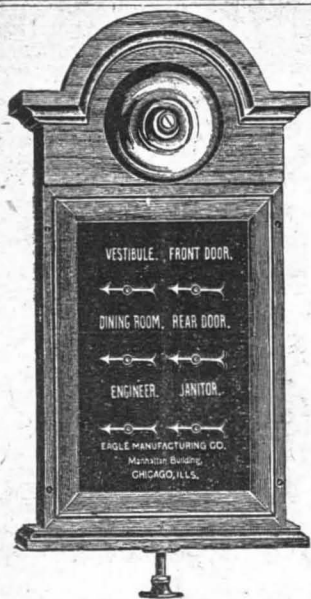
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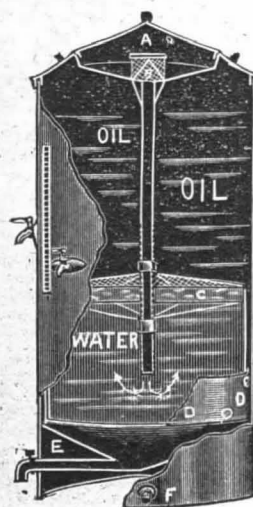
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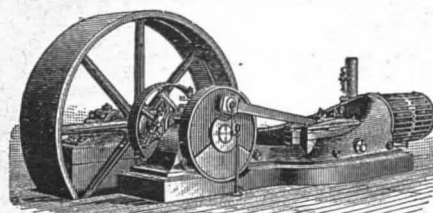
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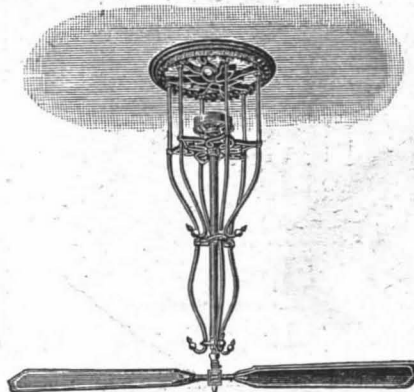
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